ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
BUREAU OF AIR

October 2006

Responsiveness Summary for Public Questions and Comments on the Construction Permit Application from Patriot Renewable Fuel, LLC for an Ethanol Plant in Annawan, Illinois

Site Identification No.: 073802AAA
Application No.: 06010085

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INTRODUCTION

Patriot Renewable Fuel, LLC (Patriot) has applied for an air pollution control construction permit to build a fuel ethanol production plant approximately 1.5 miles east of Annawan in Henry County.

Upon review of comments received during the public comment period and final review of the application, the Illinois Environmental Protection Agency (Illinois EPA) has determined that the application meets the standards for issuance of a construction permit. Accordingly, on October 5, 2006, simultaneously with the issuance of this Responsiveness Summary, the Illinois EPA issued a permit to Patriot to construct the proposed plant. The plant must be constructed and operated in accordance with applicable regulations and the terms and conditions of the issued permit.

The issued permit includes a number of additional requirements for the proposed plant compared to the draft permit, as well as various clarifications to conditions, based on public comments. In particular, the issued permit contains additional limitations on certain operations at the proposed plant and additional requirements for emissions testing, monitoring and recordkeeping to assure that the proposed plant would not be a major source of emissions under the federal rules for Prevention of Signification Deterioration (PSD), 40 CFR 52.21.

DESCRIPTION OF PROPOSED PLANT

Patriot has proposed to construct a plant to produce ethanol from corn. The plant would be designed to have a nominal capacity of 100 million gallon per year, with the ability to actually produce up to 110 million gallons of ethanol per year. The denatured ethanol produced by the plant would be used as motor vehicle fuel. When added to gasoline, ethanol is an octane enhancer and oxygenated fuel additive, which reduces hydrocarbon and carbon monoxide emissions in vehicle exhaust. The plant would produce ethanol by batch fermentation of ground corn, followed by processing to separate out and purify the ethanol. The plant would also produce animal feed from the stillage material remaining after the fermentation process. The plant would have facilities to receive raw material (grain) and ship products (fuel ethanol and feed) by both truck and rail. Natural gas would be used as the fuel for the plant.

COMMENT PERIOD AND PUBLIC HEARING

The Illinois EPA Bureau of Air evaluates applications and issues permits for sources of emissions. An air pollution control permit application must appropriately address compliance with applicable air pollution control laws and regulations before a permit can be issued. Following its initial technical review of Patriot's application, the Illinois EPA Bureau of Air made a preliminary determination that the application for the proposed plant met the standards for issuance of a construction permit and prepared a draft permit for public review and comment.

The public comment period began on June 17, 2006, with the publication of a notice in the Kewanee Star Courier on June 17, 2006. The notice was also published in the Kewanee Star Courier on June 24 and July 1, 2006.

A public hearing was held on August 2, 2006, at the Annawan Meeting and Banquet Center to receive oral comments and answer questions regarding the application and draft air permit. The comment period closed on September 1, 2006.

AVAILABILITY OF DOCUMENTS

The permit issued to Patriot and this responsiveness summary are available on the Illinois Permit Database at www.epa.gov/region5/air/permits/ilonline.htm (please look for the documents under All Permit Records (sorted by name), State Construction Permits). Copies of these documents may also be obtained by contacting the Illinois EPA at the telephone numbers listed at the end of this document.

GENERAL COMMENTS WITH RESPONSES BY THE ILLINOIS EPA

1. Will there be problems with air quality once this plant is built?

The proposed plant is located in a rural attainment area for all criteria air pollutants. In Illinois' rural attainment areas, the construction of a new minor source does not pose a concern for its impact on ambient air quality. This will be the case for the proposed plant even with the sources that are already present in Henry County.

2. Will the plant be odorous in the surrounding communities? Will the Illinois EPA make the determination of what type of equipment to use to control odors now or after the plant is causing odors?

The emissions from the proposed plant will be well controlled using equipment that is now standard at new fuel ethanol plants. This control equipment, which includes a scrubber for the fermenters and oxidizer systems for the distillation units and feed dryers, will also control emissions of odors from the plant. The construction permit does not excuse Patriot from the obligation to undertake further actions to control emissions if needed to eliminate a public nuisance due to odors from the plant. If a problem would occur, the Illinois EPA would review the adequacy of the plant's proposed response to the problem, including any additional equipment that the plant would propose to install, to confirm that the proposed response has been developed to adequately and appropriately respond to the problem.

3. If you drive through downtown Peoria you can smell the corn being processed at the nearby ethanol plant.

The ethanol plant near downtown Peoria is not an appropriate basis of comparison for the proposed plant. That plant is an "existing" ethanol plant that was built before the era of

modern emissions controls. At the present time, only a portion of the exhaust from the feed dryers at the plant in Peoria is controlled by a thermal oxidizer, with the remainder of the exhaust still required to be controlled pursuant to joint federal-state consent decree with the operator of the plant.

4. The draft permit would allow the boilers at the plant to have three times the emissions of similar types of boilers in Indiana and Ohio.

The Illinois EPA could not conduct a specific review in response to this comment because it was not accompanied by supporting material. However, the Illinois EPA believes that the requirements on the boilers at the proposed plant are similar to the requirements that apply to other comparable, new boilers located elsewhere. This is because the natural gas fired boilers at the proposed plant, which also function as oxidizers to control emissions of volatile organic material (VOM) from a number of operations at the proposed plant, would be subject to requirements under the federal New Source Performance Standards (NSPS), which are applicable nationwide to large, new boilers.

5. The draft permit does not require Best Available Control Technology (BACT).

BACT is a requirement of the federal rules for Prevention of Significant Deterioration of Air Quality (PSD), 40 CFR 52.21. The BACT requirement of the PSD rules applies to major projects, i.e., new major sources and major modifications at existing major sources. The proposed plant is being developed so that it will be a minor source for purposes of the PSD rules, so that the plant is not subject to the BACT requirement of the PSD rules.

Even though the proposed plant is not subject to BACT, the permit does include requirements that control devices be operated for effective control of emissions, separate and apart from requirements in the permit that limit emissions of the proposed plant so that it is not a major source.

6. If the proposed plant will be using control technology that equates to BACT, then this should be written into the permit.

As discussed above, the proposed plant is not subject to BACT and a BACT analysis has not been performed for the plant. As such, because of the lack of applicability and analysis, emission control requirements in the permit cannot be labeled or defined as BACT.

7. Why can't the permit allow for maximum generation and maximum emissions so that the plant will be a major source subject to BACT? That means that there would be more control and a better plant.

The permit for the proposed plant allows "full operation" of the plant, consistent with its physical capacity. The permit cannot allow more emissions than are proposed by a permit applicant to artificially create a major project. In addition, the broad requirement that the

plant maintain emissions at minor source levels also acts to require that a variety of specific measures be used at the plant to effectively control emissions.

8. There is nothing to prevent Patriot from requesting that the Illinois EPA put conditions in the permit for the proposed plant requiring 99.9% control efficiency.

The Illinois EPA would not issue a permit for the proposed plant that requires 99.9% control efficiency because this level of control is not achievable with the emission control technology that is current available. The permit establishes emission control requirements for the proposed plant that are consistent with the demonstrated capabilities of available emission control technology.

9. The draft permit sets limits on the emission that are just below the thresholds at which the plant would be considered a major source.

This is correct. However, Patriot has conservatively applied for emission limits that are believed to generally reflect the emission guarantees that it has obtained for the proposed plant. It is expected that the actual emissions of the plant would be below these numbers. As an example, as stated in other comments, oxidizers can achieve higher efficiencies in practice than the minimum efficiency required by the permit and higher efficiencies in practice would lower the actual emissions from the plant.

10. There are serious problems with the determination of potential emissions for a number of operations at the proposed plant, as addressed in separate detailed comments. If the potential emissions of the proposed plant for any criteria pollutant are 100 tons per year or more, a permit may not be issued since the proposed plant has not undergone review under the federal PSD rules, as is required for a proposed major source.

    This is a critical issue because the margins between the permitted emissions for the proposed plant and the 100 ton/year major source threshold are very small for most pollutants. Based on the summary of emissions in Table 1 of the draft permit, these margins are 0.46, 2.27. 4.73, and 6.95 tons per year for particulate matter (PM), volatile organic material (VOM), nitrogen oxides (NOx), and carbon monoxide (CO), respectively. The detailed comments for certain units at the proposed plant show that the potential emissions of those units have been underestimated. When these underestimates are considered, it is clear that the proposed plant will be a major source for certain pollutants. In addition, for the specific units for which emissions have been underestimated, these emission calculations constitute errors in the application.

In the issued permit, the "margins" between the permitted emissions of the plant and the 100 ton/year major threshold source are all at least 2.0 tons. This is an adequate margin given the nature of the underlying emissions calculations and the provisions of the permit that act to ensure that the proposed plant will not be a major source of emissions. The various comments on specific operations do not identify fundamental flaws in the evaluation of the emissions of the proposed plant, whose correction results in the proposed plant being a major source.

11. If there are concerns about emissions and water pollution, why can't the Illinois EPA go above and beyond the regulations to assure that the local residents are not affected? When the permitted emissions are this close to the major source thresholds, greater scrutiny and greater monitoring should be required of a plant.

The Illinois EPA can respond to public concerns about a proposed plant by imposing reasonable requirements on the operation of the plant that relate to such concerns. However, the Illinois EPA cannot alter fundamental requirements for the plant, which are set by law and regulations. In this regard, when a plant's permitted emissions are close to the major source threshold, the Illinois EPA can impose monitoring requirements on the plant that might not be needed or appropriate if the permitted emissions of the plant were lower. This commonsense principle is implemented in the conditions of the permit. The operational requirements on emissions and operation of the proposed plant, as well as the associated requirements for emission testing, monitoring, and recordkeeping, are much more rigorous than the requirements in permits for plants with less capacity, for which there is a greater margin from the major source thresholds.

12. Has the Illinois EPA evaluated the proximity of the proposed plant to schools and the City of Annawan and the surrounding communities?

As already explained, the proposed plant should not pose a threat to local ambient air quality, as considered by the Illinois EPA in permitting based on the general nature of the plant and the area in which it is being located. Other aspects of the siting of proposed ethanol plants, like other industrial land uses, are subject to appropriate zoning and land use planning, which are the responsibility of and administered by local governmental authorities.

13. The plant would have an 18,000 gallon tank for storage of anhydrous ammonia. What is going to be done about ammonia emissions? What if the tank were to rupture?

Anhydrous ammonia is a common agricultural chemical that is routinely handled in rural areas in Illinois without significant risk to the general public. Anhydrous ammonia is normally contained under pressure to prevent emissions. Facilities that handle anhydrous ammonia have safety plans to address the potential for leaks or failure of the ammonia handling equipment. In addition to measures to protect plant personnel, these plans also address notice to local emergency response personnel to allow any necessary measures to be implemented to protect the public, including evacuation of nearby residents if needed.

14. The plant would not have a vapor recovery system to collect displaced vapors from the loadout of ethanol.

The ethanol loadout operations at the plant would be controlled, with displaced vapors collected and combusted in a flare.

15. What is the maximum amount of ethanol that can be stored at the plant?

The plant is being developed with the capability to store 3.6 million gallons of fuel ethanol and denaturant in five storage tanks.

16. How will methane gas from the process be removed?

Methane is not produced by the main ethanol production process. Methane will be produced in a secondary support operation, the bio-methanator. The purpose of the bio-methanator is to reduce the organic content in certain process wastewater streams prior to reuse, by converting the organic material into a methane-rich gas stream that can be burned as fuel. This biogas would be used as fuel in the feed dryers at the plant. If the biogas cannot be used as fuel for some reason, the biogas would be burned in a flare without taking advantage of its value as fuel.

17. There will be wastewater from the proposed plant. Where will the wastewater go? Will there be a wastewater treatment facility?

The proposed plant is being designed so that process water would be reused at the plant, so that there would not be a discharge of process wastewater. In general terms, process water recovered from the back of the plant would be returned to the front end of the plant. Separate from process wastewater, the proposed plant will have a discharge of non-contact water from the cooling tower, for which Patriot will have to obtain an appropriate wastewater discharge permit. This wastewater stream will be managed to maintain the level of dissolved solids within the limits set by the wastewater permit.

18. Where will stormwater from the plant be discharged to and will it be treated before discharge?

The standard approach to stormwater management is collection of potentially contaminated storm runoff in a retention basin or pond, to allow treatment if needed. Retention ponds at ethanol plants have not been identified as a source of concern for emissions.

19. Where will the water for this plant come from? Will wells that provide water for the plant affect the wells of residents that live in the area?

Patriot has stated that water for the plant would come from deep wells, which means that the wells hould have no affect on residential wells that draw water from shallow aquifers.

20. Is the local fire department capable of handling a fire or other incident at the plant?

Patriot must work with local emergency response officials to assure that the plant has been developed and contingencies plans are in place to appropriately address the risk of fire and other incidents at the plant. Fire preparedness plans routinely address the capabilities and appropriate roles of local response personnel. They also address the resources that would

be available on a regional basis to respond to incidents, as is especially important for plants located in small rural communities.

21. The permit needs to have stronger conditions.

The draft permit contained rigorous requirements for the plant. These requirements have been further developed in the issued permit, which includes a variety of requirements for the various units at the plant to ensure that emissions are properly controlled and do not exceed the applicable major source thresholds. Emission testing must be conducted on significant units at the plant after construction to verify that emissions at maximum throughput and normal operating conditions will be within the limits established by the permit. Units must also be promptly retested upon written request by the Illinois EPA. NOx continuous emission monitoring is required for the oxidizer/boiler systems. Additional emissions monitoring for CO is required unless emission testing shows that these systems normally meet the applicable limits with a respectable compliance margin. A variety of operational monitoring is required for the control equipment at the plant to verify proper operation. Patriot will also have to keep operating records that will allow Patriot and the Illinois EPA to verify whether the plant is operating in compliance and identify any period when a unit may be exceeding applicable emission limits or other requirements.

22. The construction permit for the proposed plant would not address operation of the plant beginning one year after it is built.

When a construction permit is issued for a source, the emission control requirement in the construction permit continues to govern the operation of the source until an operating permit is issued. Unless action is taken during the processing of the operating permit application for the source to revise emission control requirements, the requirements in the construction permit will continue to apply and will be carried over into the operating permit.

23. The Illinois EPA does not have the budget or staff to inspect or test ethanol plants.

Staff from the Illinois EPA's Regional Office in Moline will inspect this plant to verify that it is meeting applicable air pollution control requirements. Reductions in the budget and staffing of the Illinois EPA require the Illinois EPA carry out its activities more efficiently and place a greater responsibility on sources so that the Illinois EPA's resources can be applied where they are most needed. This includes witnessing required emission testing, which sources must have performed prior to obtaining operating permits, to confirm that applicable emission standards and emission limits established in construction permits are met. It also includes inspections of sources at which problems have been observed or for which pollution complaints have been received from the public.

The costs for emission testing are placed on the plant, as is appropriate since it is the source of emissions. The plant is required to hire an independent testing service to perform all required emissions testing. Prior to testing, a testing plan must be submitted to the Illinois

EPA for review. Illinois EPA personnel will be present during testing to observe both the execution of the testing and the operation of the plant during testing.

24. At the Adkins Energy ethanol plant in Lena, citizens had to sue Adkins to get it to clean up its emissions because the Illinois EPA permit was not stringent enough for the Illinois EPA to enforce.

If there are nuisance odors from the plant, the Illinois EPA would take action to ensure that the plant was taking appropriate steps to eliminate such odors. After Adkins Energy began operation in the summer of 2002, the Illinois EPA took action based on public complaints about the odor and inspections of the Adkins plant by Illinois EPA personnel, which determined that the control equipment on the plant did not adequately control emissions. Adkins was required to install a thermal oxidizer at the plant to appropriately control emissions from the feed dryer and distillation operations. A group of local citizen also decided to take legal action against the plant after the Illinois EPA had begun its investigation and enforcement actions against the plant.

The stringency of the construction permit issued to Adkins Energy was not a factor that interfered with or impeded these enforcement actions. Rather, the original feed dryer at the Adkins ethanol plant was not equipped with a thermal oxidizer. Instead, the dryer was designed to control organic emissions, including odors, by recirculating most of the exhaust from the dryer back through the burner and furnace at the front of the dryer. This design was not effective in controlling emissions, with both excess emissions and nuisance odors. The enforcement action that ensued led to a consent decree with Adkins. Under the decree, Adkins was required to install an oxidizer to control the feed dryer. The plant then operated for approximately a year without a feed dryer, selling all of its feed production as wet cake, rather than dry feed, at great inconvenience and significant loss of revenue to the company, until the thermal oxidizer was installed.

25. There are a lot of problems with other ethanol plants around the country and there have been problems with emission and wastewater discharges at other new ethanol plants.

While there have been and likely will continue to be problems at new ethanol plants, these problems can be and have been addressed and corrected. The occurrence of these problems does not represent a fundamental flaw in the environmental control technology used at new ethanol plants, particularly given the stringent requirements that are being set for these plants. In addition, the Illinois EPA's experience with emissions from ethanol plants in Illinois is that emissions from ethanol production operations can be effectively controlled by appropriate design and proper operation of scrubbers and oxidizers or other combustion-type control devices.

26. Anytime you have industry and toxic chemicals going into the atmosphere, there is going to be disease.

The fact that industrial plants have emission is not a basis on which to deny a construction permit for the proposed plant. The purpose of air pollution control regulations and

permitting is to help assure that emissions are appropriately controlled and public health is protected. Even in urban areas where there are air quality problems, the focus of efforts to improve air quality is on existing sources located in the urban area and on large, existing sources of emissions, like power plants, which while located in areas that do not have problems with air quality, contribute to background levels of air quality so as to contribute to the problems experienced in the urban area.

COMMENTS ON THE DRAFT PERMIT WITH RESPONSES BY THE ILLINOIS EPA

27. The draft permit would allow the proposed plant to process up to 40 million bushels of grain per year (Condition 1.1(a)). However, the emission calculations in the application are based on processing 1.1 million tons of corn, which is equivalent to only 39.3 million bushels. The 40 million bushel limit in the draft permit is 1.8% higher than a fundamental element of the emission calculations for the plant. Either the permit should limit the annual grain input to no more than 1.1 million tons or Patriot should submit revised emission calculations to account for processing 40 million bushels of grain per year.

The issued permit limits the amount of grain processed by the plant to 1.1 million tons, as recommended by this comment.

28. The determination whether the proposed plant is minor for particulate matter (PM) under the PSD rules must consider both filterable and condensible PM emissions, since both contribute to particulate emissions, as addressed by the PSD rules. Recent tests at the VeraSun ethanol plant in Fort Dodge, Iowa show that when grain handling and milling are controlled with baghouses, condensible PM constitutes the majority of PM emissions from the operations. The provisions of the permit for emission testing should require condensible PM emission determinations for the baghouses controlling the grain handling and milling operations.

The issued permit requires that all emission testing for PM also include measurements of condensible PM. This step was taken to assure that all PM emissions testing fully quantifies PM emissions, even though the emissions of condensible PM from grain handling and milling operations are expected to very small and should not impact compliance determinations, as confirmed by the measurements at the VeraSun plant.

Condensible PM emissions from these operations also will not affect the determination that the proposed plant is not a major source. This is because condensible PM is a component of particulate matter$_{10}$ (PM-10) but not total suspended particulate (TSP), as generally addressed by the permit. The permitted PM-10 emissions of the proposed plant are less than 85 tons/year, compared to the major source threshold of 100 tons/year.

29. The provisions of the draft permit for emission testing for VOM and HAPs provide that "Testing shall be conducted in accordance with industry-specific guidance from USEPA on testing VOM and HAP emissions at ethanol plants." This is an indeterminate qualification on the testing requirement. The permit should cite a particular USEPA

guidance document published on a specific date and the effect of such document on compliance with VOM emission limits. Language should be included in the permit to clarify that all measurements by USEPA Method 25/25A should be subject to USEPA's current scalar factor (a multiplier of 2.2), with that value compared against the applicable VOM emission limits. The permit should also provide that USEPA Method 18 measurements of VOM in terms of specific compounds or a USEPA Method 25/25A measurement as adjusted by the scalar factor of 2.2, whichever is larger, can be used to enforce the permit's VOM emission limits.

The provisions in the permit are appropriate. Because USEPA may continue to evaluate and refine its guidance for testing of VOM emissions at ethanol plants and other grain processing plants, it is not possible for the permit to refer to a particular version of USEPA's guidance. The general effect of this USEPA guidance is also clear, as it requires VOM test results to be properly "adjusted" to accurately reflect the actual mass of VOM emissions. The issued permit does include additional language referring to the default scalar factor in current USEPA guidance, 2.2, so that this factor is readily understood. However, this scalar factor cannot be imposed on a continuing basis, as relevant USEPA guidance on this topic may continue to develop. Finally, it is not necessary for the permit to state that compliance with VOM emission limits expressed in pounds or tons shall be based on the actual mass of a pollutant that is emitted, as that is the manner in which VOM limits are generally established and enforced.

30. Measurements of emissions by USEPA Method 18 should be required to address at least 20 specific organic compounds, including acetaldehyde, acetic acid, ethanol, formaldehyde, formic acid, furaldehyde, methanol, glycerol, lactic acid, butanol, acrolein, isoamyl alcohol, ethyl acetate, succinic acid and isoamyl acetate.

While emission measurements for many of the compounds listed in this comments will be made as part of VOM emission testing, the extent of such testing is a matter that is appropriately resolved shortly before testing, as part of the approval of a test plan by the Illinois EPA. As explained above, USEPA guidance for testing of organic emissions at fuel ethanol plants may still evolve.

Emergency Engine (Condition 2.1)

31. For the 300 hp diesel engine-generator for the emergency firewater pump, the emission factors used in the application are significantly lower than the factors published by USEPA for small, uncontrolled diesel engine (*Compilation of Air Pollutant Emission Factors*, USEPA, AP-42). The factors in the application are 53%, 37%, 12%, 9.1% and 9% of the USEPA's emission factors for SO2, NOx, VOM, CO and PM, respectively. Although the permit application indicates that it is based on the manufacturer's emission factors, no supporting information e.g., manufacturer guarantees or product literature, was provided.

The emission factors used in the application are reasonable for a new diesel engine. Given the improvements that have occurred in diesel engine technology in recent years, it is not

appropriate to use the information in AP-42, which addresses existing engines and is 10 years old, as a basis to assess the adequacy of the emission calculations for the emergency engine.

32. The permit application is incomplete because it does not contain information to support the claimed emission control performance. The application's emission calculations should not be approved unless and until it is supplemented by specific vendor guarantee information and information about engine emission controls, if any.

The information in the application is sufficient, when one considers that the engine is an emergency engine and its emission have been conservatively estimated. If adjustments to the emission limits for the engine are needed as further detailed data becomes available, the limits can be readily adjusted by lowering the permitted operation of the engine. This is because the emission calculations are based on operation for up to 300 hours per year, as limited by the permit. This greatly exceeds the actual level of operation expected of the engine, which could be less than an hour each month.

33. The application does not provide information on any emission control equipment that is intended to be installed on the engine. It appears likely that control equipment or adjustments to engine operation will be necessary to meet the emission rates claimed in the application. If the performance of the emergency engine depends on the use of emission control devices, such as trap oxidizers, then additional monitoring and recordkeeping provisions should be included in the permit to ensure that such devices are properly operating.

Add-on control equipment or engine adjustments, as addressed in this comment, are not routinely used on small emergency engines. Due to the limited usage of these engines and the need for simple, reliable operation, these engines are usually the basic, low-emission engines available from manufacturers.

34. The fuel tank associated with the emergency engine and its emissions are missing from the application for the proposed plant.

The fuel tank for the emergency engine does not require a permit. It will also be a trivial source of VOM emissions.

Grain Handling and Milling (Condition 2.2)

35. The application does not include technical details for the design of the grain receiving area or the associated fugitive emissions collection system, including the effective grate area of the dump-pit and the amount of aspiration air. This is unacceptable because it is not possible to know if the design of these systems will properly and effectively collect fugitive emissions.

Grain receiving operations at new elevators can be readily designed and constructed to control PM emissions. The permit requires that the PM emissions from grain receiving at

the proposed plant not exceed 5 percent opacity. This sets the "specifications" for control of PM emissions from the grain handling operations, which the operations and associated control devices must be designed, constructed and operated to meet. Even if the design of the proposed operation had been completed and details of the design submitted in the application, review of that design data for the operation would not excuse Patriot from complying with the performance specification for the operation established in the permit.

36. The baghouse for grain handling operations, which has a capacity of 48,000 SCFM, serves other grain handling operations beside the receiving area. The application does not contain information on the amount of aspiration air to each operation or information on baffles and other control measures on each operation. Without this information, one cannot ensure that the system is designed to provide 95% collection efficiency, as relied upon in calculating PM emissions. Any increase in the size of the baghouse to assure effective control of emissions or failure of the fugitive emission collection system to properly function would threaten to push the plant's PM emissions over the major source threshold. The application should be considered incomplete until these details for the design of the control system are provided.

As explained above, the grain handling operations can be readily designed to achieve effective control of fugitive PM emissions. The receiving of grain at the proposed plant is the only operation for which such emissions pose any particular concern. Once grain has been received, operations can be readily enclosed so as to allow effective capture of PM emissions. The capacity of the baghouse for grain handling operations provided in the application, 48,000 SCFM, should be ample for effective control of emissions.

37. The application must be revised to consider condensible PM emissions from the grain handling and milling operations at the proposed plant. In PM emissions testing conducted at VeraSun in Fort Dodge, Iowa, a 110 million gallon/year fuel ethanol plant, it was found that condensible PM constitutes most of the PM emissions from both the milling and grain handling operations. Emissions of condensible PM, as measured by USEPA Method 202, were 0.132 and 0.069 lb/hr from the baghouses for grain handling and milling, respectively. Assuming continuous operation, the condensible PM emissions from these two operations at the VeraSun plant would be 0.88 tons/yr.

The data provided in this comments confirms the conservative nature of the PM emissions calculations in the application for the proposed plant. It does not show a need for changes to the application or the permit. This is because the comment cites data showing actual PM emissions of at most 1.8 tons/yr, total, from the baghouses for grain handling and milling at the 110 million gallon/yr VeraSun plant. The permit for the proposed plant conservatively accounts for and allows PM emissions of up to 17.24 tons/yr from these units.

38. The requirements of 35 IAC 212.462 should apply to the grain handling operations at the proposed plant, i.e., Condition 2.2.5(b) should not be included in the permit. This condition in the draft permit provides that an individual grain handling operation need only comply with applicable requirements of 35 IAC 212.462 if a certified investigation performed by the Illinois EPA determines that the operation is causing or tending to

cause air pollution. This condition makes grain handling operations at the plant conditionally exempt from the requirements of 35 IAC 212.462, with applicability only triggered if the Illinois EPA finds that an operation is causing air pollution.

The grain handling operations are not entitled to this exemption because another criterion for this exemption will not be met. The relevant portion of Section 9(f) of the Environmental Protection Act (which is the legal basis for this provision), also provides that a criterion for exemption is that a grain elevator not be required to obtain a Clean Air Act Permit Program permit pursuant to Section 39.5 of the Act. Since the proposed plant will be required to obtain a Clean Air Act Permit Program permit pursuant to Section 39.5 of the Act, due to the applicability of certain New Source Performance Standards (NSPS) to certain units, the plant is not entitled to this exemption. The elevator is also not entitled to this exemption because it would be a new elevator under 35 IAC 212.462(e), with an annual grain throughput over 300,000 bushels. Further, the elevator does not qualify for an exemption under 35 IAC 212.462 through reference to 35 IAC 212.461(c) or (d). Finally, the primary purpose of this plant is not to act as a grain elevator in the traditional sense that motivated the legislative intent of the statutory language. This is primarily an ethanol plant and not a stand-alone grain elevator.

The condition of the draft permit addressed by this comment properly reflect the provisions of the Environmental Protection Act (Act), which supersede the otherwise applicable state rules for grain elevators at 35 IAC 212.462. At the present time, the proposed plant would not be subject to any of NSPS for which federal regulations require a source to obtain a CAAPP Permit. (If federal regulations change in the future, a CAAPP permit could be required, which would also trigger applicability of 35 IAC 212.462 for the grain handling operations.) The various state rules cited in this comment do not act to trigger applicability of 35 IAC 212.462, given the overarching effect of the Act. Finally, the language of the Act is clear on its face and it is not necessary to speculate on legislative intent. If such speculation is desired, a better explanation of that intent is available than offered by this comment. The legislature acted because it found that the requirements of 35 IAC 212.462 were excessive if a grain operation was not causing air pollution, perhaps in part due to increased use of hopper trucks and improved dump pit designs, which have made the specific requirements of 35 IAC 212.462 outdated and unnecessary.

39. Even if the grain handling operations are exempt from 35 IAC 212.462, the requirements of these rules should be applied to assure compliance with applicable emission limits on the operations. Particularly for the fugitive emission limit from grain unloading, it is essential to ensure the design and operation of the dump pit to achieve the face velocity specified in 35 IAC 212.462(b).

The Illinois EPA agrees with the spirit of this comment but not its substance. To ensure effective control of fugitive PM emissions from grain handling operations, including the dump pit, the permit relies on the requirements of the federal NSPS for grain elevators, 40 CFR 60, Subpart DD. Even though the plant will not meet the applicability criteria of these rules, the relevant requirements of this NSPS are imposed on the proposed plant. This is because this NSPS sets restrictions on opacity and the presence of visible emissions

from grain handling operations, so as to directly address the effectiveness with which fugitive PM emissions are controlled. Accordingly, the NSPS is a more appropriate means to address the adequacy of emission control measures than the equipment standards in 35 IAC 212.462, which many consider outdated given developments that have occurred in the grain handling industry.

40. Since compliance with the requirements of 35 IAC 212.462 is mandatory, the permit must include requirements for testing and operational monitoring to ensure compliance with those requirements. These would include measuring collection system flow rates at key locations based on testing of face velocities and establishment of set points for compliance evaluation based on flow rates, means to ensure that apportioned gas collection rates were being achieved, periodic opacity monitoring requirement to address the no visible emission requirement and other monitoring for each element of 35 IAC 212.462. In addition, ongoing operational monitoring and measures are needed to ensuring compliance with the fugitive emission limits of Condition 2.2.6, for which compliance is dependent on effective capture of emissions.

As already explained, unless grain handling operations at the proposed plant cause air pollution, it is not expected that they will be subject to 35 IAC 212.462. However, the permit includes appropriate work practices and testing, instrumentation and recordkeeping requirements to verify that the measures to control PM emissions from the grain handling operations are properly implemented and to reasonably identify any lapses in such control measures.

41. The grain handling and milling baghouses must be subject to monitoring sufficient to assure compliance during the period between emission testing. Monitoring of pressure drop may be sufficient to ensure that gross baghouses failures are detected, but pressure drop is not a sufficiently sensitive technique to detect small leaks and other smaller filter failures that will interfere with compliance with the specified limit of 0.005 grains per standard cubic foot (gr/scf).

For baghouses used for grain handling and milling, as well as most other applications, the accepted practice for operational monitoring is measurement of pressure drop. The performance limit set for the baghouses at the proposed plant, 0.005 gr/scf, is not so different from the performance specification for most new baghouses in similar service, 0.01 gr/scf, to require additional operational monitoring. Monitoring of pressure drop will serve to both assure that the baghouse is being properly operated, without being subjected to high pressures that would threaten the integrity of the filter, and identify deterioration in the performance of a baghouse, which would be revealed by a low pressure drop.

42. Use of "manufacture recommendations" in the operational requirements and monitoring provisions for grain handling and milling operations at Conditions 2.2.5(c) and 2.2.5(d)(i) is indeterminate; such provisions cannot be enforced in practice. The permit should include specific enforceable requirements for emissions and parameter monitoring. For example, the baghouse pressure drop parameters and an envelope of variance from such parameters should be determined and fixed during emission testing. The permit should

establish a procedure by which such limits on parameter set points and maintenances of minimum tolerances as an envelope of operation is established pursuant to testing and communications with Illinois EPA. The permit should also set minimum standards for accuracy and testing of pressure drop instrumentation.

For certain operational requirements and monitoring and instrumentation for operational parameters, a requirement that a source follow manufacturer's recommendations is enforceable. It is a simple matter to compare the actual practice or action to those that are recommended by the manufacturer. It is not necessary for the permit to establish specific protocols for measurement of parameters like pressure drop, temperature or liquid flow rate, for which operational measurements are routinely and reliably made by sources as part of their standard operating practices.

43. Continuous bag leak detection systems must be required on the grain handling and hammer mill baghouses to ensure compliance with the 0.005 gr/scf performance limit for PM emissions. An annual baghouse inspection is not sufficiently frequent to provide assurance that compliance with applicable limits is being achieved.

Bag leak detection systems are used on large baghouses on units such as solid fuel fired boilers and steel furnaces. They are not necessary or appropriate for baghouses used on grain handling or milling operations.

44. Certain conditions in the draft permit that require emission testing, e.g., Condition 2.2.7 for grain handling, contain the words "as requested … as specified …," which suggests that emission testing is not mandatory. This wording should be changed to eliminate any suggestion that emission testing is only being requested, but is not required.

The conditions of the issued permit do not include the language from the draft permit addressed by this comment, which could easily have been misunderstood.

45. Condition 2.2.6(b)(i) should be more specific in referencing emission point descriptors and the stacks downstream from baghouses. The language used does not specifically identify the location of applicability for these emission limits. The fugitive emission points and process equipment for which Condition 2.2.6(b)(ii) is applicable should also be specifically named to reduce the potential for unclear interpretation of the applicability of requirements.

The permit adequately and appropriately specifies applicability of emissions limits to particular emission units. Limits apply to the units that generate emissions, or when such emissions are controlled, the emissions of the units considering the effect of the associated control device. As separate limits are established for "controlled" and "fugitive" emissions from a unit or units, the limit for controlled emissions applies to the exhaust from the control device and the limit for fugitive emissions applies to emissions that are not captured. In this regard, Condition 2.2.6(b)(ii) addresses all PM emissions from the grain handling and milling operations that are not captured. It is not necessary for the permit to

identify the specific stacks to which limits apply, particularly as doing could lead to future controversy if the permit inadvertently failed to identify all relevant stacks.

The permit also appropriately addresses emissions from the proposed plant as a whole. In addition to limiting the emissions of individual units or groups of units, the permit also sets overarching limits on the total emissions of the plant. This provides certainty as to the overall emissions of different pollutants for which the proposed plant is being permitted.

46. Conditions 2.2.6(a)(ii) and (iii), which address grain handling operations, should either state that these opacity limits apply on an instantaneous basis or on a 6-minute average.

The issued permit provides that the opacity limit applies on a 6-minute average, consistent with the applicable USEPA test method, Method 9. The prohibition against visible emissions is an "instantaneous" requirement, as implicit in the language and the associated USEPA test method, Method 22.

47. The permit should prohibit the plant from receiving grain from straight trucks (dump trucks). The PM emission calculations for the plant assumed that all deliveries would be made by rail cars and trucks with hopper bottom unloading capability. The PM emission factors for grain unloading from straight trucks are considerably higher and were not used in the emissions calculations. Any receiving of grain from straight trucks would push the plant over the 100 ton/year major source threshold for PM, so it is necessary to ensure that such grain deliveries do not take place, with a prohibition in the permit.

The issued permit includes a requirement that the grain receiving area be equipped with quick closing doors and an aspirated dump pit if grain is received from straight trucks. This appropriately addresses the additional PM emissions that might accompany receiving of grain from straight trucks.

48. If the plant intends to receive grain by straight truck (e.g., grain directly from area farmers), then the emission calculations must be redone and a limit placed on the number of such trucks per year that may unload grain at the plant. At the very least, Patriot must disclose the expected split between deliveries between straight and hopper bottom trucks. Finally, if the plant ever intends to receive untried grain directly from area farmers, the emissions estimation method used for grain receiving significantly underestimated actual emissions.

As explained above, the issued permit requires that the grain receiving area include certain control measures, i.e., an aspirated dump-pit and quick closing doors, if grain is received from straight trucks. This addresses the additional PM emissions that would otherwise potential be present if grain is received from straight trucks. The plant is not being developed with the capacity to mill wet grain, so the permit does not need to include provisions to address handling of wet grain.

49. The permit should prohibit all outdoor storage of grain for any reason, such as storage of off-specification grain, or outside storage of milled grain from upsets of the mash preparation process.

It is not appropriate for permit to address the outside storage of grain because the plant is not being developed with facilities to store grain outside or to subsequently handle grain that has been stored outside. It is also not appropriate for the permit to speculate on upsets that might occur at the plant and the actions that might be needed to address them.

Mash Preparation and Fermentation Area (Condition 2.3)

50. The application does not indicate whether the emission factor used to calculate VOM emissions from fermentation scrubber is based simply on USEPA Method 25/25A measurements or on scaled determinations for total VOM compounds considering the mass contribution of oxygenates as required by USEPA policy. Until such information is provided, the application should be considered incomplete.

These emission calculations are based on the actual mass of VOM emissions, not measurements of VOM expressed in terms of carbon, methane or other standard gas.

51. The VOM emission factor used in the application for the proposed plant is 910 lb/million gallons of ethanol, yielding annual VOM emissions of 50.0 tons/yr. In the application for the proposed Marquis Energy plant in Hennepin (Marquis), the VOM factor is 698 lb/million gallons, yielding 38.4 tons/yr. In both applications, the documentation for the VOM emission factor for the fermentation scrubber is poor, e.g., they don't indicate whether these factors are USEPA Method 25/25A determinations or scaled determinations for total VOM emissions. Until such information is revealed and the basis of such determinations provided, the applications should be considered incomplete and non-approvable.

The differences in the VOM emission factors for the fermentation scrubbers at these proposed plants result from differences in the overall design of the respective plants and the specific design and specifications for the respective scrubbers. The proposed plant uses direct fired feed dryers. These dryers are projected to have lower VOM emissions than the steam heated dryers at the proposed Marquis plant. The lower VOM emissions from drying accommodate higher VOM emissions from the fermentation area, while still maintaining status as a minor source. With the steam tube dryers at the proposed Marquis plant, a lower rate of VOM emissions must be achieved by the fermentation scrubber to maintain status as a minor source. The emission factors used in the application for both plants account for the actual mass of VOM emissions, not the relative mass expressed in terms of equivalent carbon, propane or other organic compound.

52. For the fermentation scrubber, Condition 2.3.6(a) provides that the VOM emissions from the fermentation tanks and beer well, which will be controlled by the scrubber, shall not exceed 910 lb/million gallons ethanol or be controlled by at least 98 percent by weight. This condition does not provide effective physical limits on production or process rate

and therefore does not limit potential emissions. First, the provision allows the alternative of either a pound per ethanol final product limit or 98% control. The latter is not a physical limit on the production or process rate and does not constitute a physical limit on the potential to emit. Second, there is no short term production or process rate commensurate with the hourly VOM emission rate, 11.4 lb/hr. The maximum rate of grain input to the plant must be limited on an hourly basis in order to limit potential to emit on a short term basis. The emissions of the fermentation process should be limited through limits on the actual rolling average annual and daily feed rate of mash input (preferred) or the amount of milled corn introduced into the process.

Condition 2.3.6(a) sets operating limits that function with other limits and requirements in the permit to restrict the potential emissions of the fermentation units. As observed by this comment, this condition does not set a production limit. The limit on production of the plant, expressed in terms of ethanol production, is found elsewhere in the permit.

While USEPA guidance provides that operational limits and emission limits should be set on as short a time period as possible, so as to maximize practical enforceability, USEPA guidance does not require that production or operating limits be established that apply on an hourly basis. Certainly, USEPA guidance does not envision limiting a source or unit's "potential to emit on a short term basis" as suggested by this comment.

53. Limiting the VOM emissions of the fermentation scrubber on the basis of the final ethanol production rate, which occurs far downstream in the overall plant, is not appropriate and does not efficiently limit the emissions of the scrubber. This is because of the variabilities of the processes downstream from the fermentation area, such as the efficiency of the distillation process.

The relevant provision in the issued permit clarifies that the production based VOM limit for the fermentation scrubber is to be based on the amount of ethanol being produced by the fermentation process itself, expressed in terms of equivalent plant production.

54. Condition 2.3.5(a)(i) in the draft permit provides that the key operating parameters of the fermentation scrubber shall be maintained at levels consistent with levels at which emission testing demonstrated compliance with applicable requirements. The language is not sufficiently explicit to make enforceable a process whereby emissions testing is performed under different process operating variables and an envelope of acceptable operating parameters for the scrubber is determined and then made enforceable. Based on parameter monitoring, there must ultimately be a clear method that provides enforceable criteria as to when a unit must be considered out of compliance.

The effect of Condition 2.3.5(a)(i) is clear. After emissions testing of the fermentation scrubber is performed (which must be conducted while the fermentation area is operating at capcity), the plant must continue to operate the scrubber with a minimum water flow rate, maximum water temperature and maximum exhaust gas temperature that are consistent with the values of these operating parameters during emissions testing. Deviations from these operating requirements would be a violation of this condition. This

has obvious consequences for the operating conditions for the fermentation scrubber under which the plant elects to conduct emission testing of the scrubber, i.e., testing must be conducted with values of these operating parameters that can be consistently and reliably maintained. While testing of the scrubber with more water or colder water would show lower VOM emissions, it would also create a future obligation to always operate with "more water" or "colder water." Of course, emissions testing must also be conducted when the scrubber is operating with enough water or water that is cool enough so that the scrubber meets applicable limits.

Given the straightforward nature of the fermentation process, the Illinois EPA expects that there will be only a single normal operating mode for the scrubber. Accordingly a series of tests of the scrubber under different operating modes will not be performed. If the plant does elect to conduct several tests to address different operating modes or to establish a more complex relationship between the specified parameters, this would initially be addressed by the Illinois EPA as part of the review of the plan for testing. It would be further addressed as part of the processing of the operating permit application for the plant. For example, the different operating modes of the fermentation process would be defined, for which each set of operating parameter values would apply.

55. The conditions of the permit that set required values of operating parameters for the fermentation scrubber, as well as for other control devices, must be written to ensure that the plant may not "cherry pick" operating parameters to comply with only a single emission limit at a time. The process of establishing an operating condition envelope for compliant operation must reflect simultaneous compliance with all limits demonstrated with simultaneous and corresponding ranges of operating conditions during the test.

The draft permit does not allow "cherry picking" of operating requirements, as this comment cautions against. Where the permit contains multiple operating requirements for a control device, all requirements are to be met. Expressed in other words, a deviation from a single requirement for a control device is a deviation from proper operation of the device, even if the device is "overcomplying" with other requirements.

56. It is unclear whether "differential pressure across the scrubber" is considered a "key operating parameter" for the fermentation scrubber. The flow rate and temperature of the liquid scrubbant in the scrubber, which is a packed tower scrubber rather than a high energy scrubber, are much more important to the proper operation of the scrubber than differential pressure.

Differential pressure is not treated as a "key" operating parameter of the fermentation scrubber This is why the permit has separate provisions for proper operation of the scrubber relative to key operating parameters, i.e., scrubbant flow rate and temperatures, and proper operation relative to pressure drop. If the pressure drop of the scrubber goes outside the normal range, it is not a deviation from operating requirements for the scrubber. However, it does trigger a requirement to initiate appropriate corrective action to restore the differential pressure to the normal range.

57. The language at Condition 2.3.5(a)(ii), which relates to an operating range of the differential pressure as "defined by the Permittee" to required actions by the plant, is particularly offensive. This is because it imparts to the plant the sole discretion to determine the final form of an applicable requirement without reference to the determination through a compliance test or other agreed upon procedure. Such provisions are not practically enforceable.

This condition is appropriate and is not unenforceable. As a general matter, there is nothing improper about requiring a source to initiate corrective action when a unit is operating abnormally, particularly if the initial responsibility for defining normal and abnormal operation is placed on the source. While it may be distasteful to allow a plant to define abnormal operation for a particular operating parameter, this is direct consequence of the secondary role of differential pressure in the performance of the fermentation scrubber. This prevents the pressure differential during emission testing from being used as an appropriate basis to distinguish between normal and abnormal operation.

While it may seem that the plant is being given complete discretion to define abnormal operation of the scrubber, the plant is subject to continuing supervision by the Illinois EPA. If the plant fails to take timely corrective action in response to changes in the differential pressure of the scrubber and the performance of the scrubber and compliance are eventually affected, the Illinois EPA can cite the plant for violation irrespective of any definition of abnormal operation selected by the plant. The plant is best served by developing a sound and reasonable definition of abnormal operation that allows timely corrective action to be initiated well before compliance is threatened.

58. Condition 2.3.5(b)(iii)(C), which address the Control Improvement Program for the fermentation scrubber, does not contain a deadline for retesting of VOM emissions.

The issued permit requires retesting of VOM emissions to take place within 60 days of completion of a Control Improvement Program.

59. The draft permit should require that emission testing for the fermentation scrubber be conducted when process units are operating at least at 95% of their maximum rate.

The permit generally requires that emission testing be conducted during operating conditions that are representative of maximum emissions. (See Condition 3.1-1(a).) An obvious element of the operating conditions that produce maximum emissions from emissions units controlled by a scrubber is operation in the maximum operating range of those units, so as to present the scrubber with a high pollutant loading and high flow rate.

60. For the fermentation scrubber, Condition 2.3.8(a) indicates the monitoring equipment "....shall be installed, operated, maintained and calibrated according to the supplier's specifications...." Such language is vague and unenforceable and should be replaced with specific requirements and standards for accuracy of monitoring devices, testing and calibration requirements and requirements for at least 95% valid data recovery from such process and scrubber monitoring devices.

This requirement of the permit is enforceable. As already explained, requirements for monitoring flow rates and temperatures do not need to be accompanied by detailed protocols for how such monitoring shall be conducted.

61. The "uncontrolled" VOM generated by the fermentation process depends on the fermentation cycle in each tank, breathing losses, displacement losses upon filling and other factors. Actual VOM emissions depend on surrogate parameters of both the process generation of VOM and the parameters of scrubber operation. As a result, the recordkeeping operations required under Condition 2.3.9(a) are insufficient to reflect process and scrubber control parameters from which emissions can be determined and compliance with emission limits assured.

The records required by Condition 2.3.9(a) are not intended to be used to directly determine VOM emissions from the fermentation area or compliance with VOM limits. Rather they are intended to provide basic information about the operation of the fermentation tanks so that the Illinois EPA can readily identify any significant changes in the fermentation process. If such changes did occur, the Illinois EPA would then be able to assess whether the changes would significantly affect the VOM emissions generated from fermentation, so that retesting of the fermentation scrubber should be required

62. The recordkeeping requirements of Condition 2.3.9 do not reflect the extensive parameter monitoring requirements of Condition 2.3.8. At a minimum, all parameter monitoring of Condition 2.3.8 must be incorporated into required recordkeeping provisions.

Whenever monitoring and instrumentation are required by the permit, recordkeeping for measured data is also required. This principle has been explicitly stated in Condition 1.5 of the issued permit. Accordingly, the permit does not have to separately address recordkeeping for the data collected or measured by each required monitor or instrument.

63. The draft permit does not indicate exactly how fermentation emissions would be calculated from monitored data and required records. Since the fermentation tanks operate as batch processes, rather than merely addressing tank liquid levels, recordkeeping must address aspects of the fermentation cycle on each tank, such as the time of filling, tank temperatures, hourly average fermentation rate, hourly average transfer rate to the beer well and likely other factors. The rate of emissions would be functions of both these factors and the control device operating parameters. Until there is a firm method for making ordinary emission determinations from this unit from process and control device parameters listed in the permit, a permit should not be issued. If emissions will instead be related solely to a function of operating parameters for the scrubber and process throughput in the fermentation area, then this decision should be documented and sufficient monitoring and recordkeeping should be imposed to both support emission determinations and assure compliance with applicable limits.

As explained above, the permit does not intend that emissions generated by the fermentation area would be calculated from detailed operating data for the fermentation

area. Rather, emissions from the fermentation area would be calculated from general emission factors for the area, which would be based on the results of emissions testing. Compliance would be determined by proper operation of the fermentation scrubber, in a manner that is consistent with the operation of the scrubber during the most recent emissions testing that demonstrated compliance with applicable limits and requirements.

64. Because of process and control device variability and because of the small margin from the major source threshold for VOM, the permit should require a continuous VOM emissions monitor on the fermentation scrubber. VOM monitoring is clearly an available and appropriate technology for this control device.

The circumstances of the fermentation process do not justify continuous emissions monitoring for VOM. First, the process is not believed to be as variable or complex as the comment implies. Second, the permit requires that the fermentation process and associated scrubber be developed and operated so as to ideally operate at no more than 80 percent of the applicable limits for VOM emissions. Third, operational monitoring is adequate to both verify proper operation of the scrubber and identify improper operation of the scrubber. Finally, monitoring for VOM emissions is not readily implemented, as monitoring for VOM poses the same issues for accurate quantification of VOM emissions that are posed by emissions testing, which USEPA has addressed in its industry specific guidance for VOM emissions testing at ethanol plants.

65. Condition 2.3.10(a)(i) of the draft permit, which addresses immediate reporting by the plant for certain deviations from operating requirement for the fermentation scrubber, is not specific enough for proper enforcement. This is because it is not clear what a 2.0% exceedance would be. A 2% temperature exceedance in ºF would be different than a 2% exceedance in ºC. Does a 2% exceedance mean 2% above the floor or a maximum value of an operating parameter? The permit should address parameter envelopes of expected operations proposed for establishment on process and control device parameters during emissions testing, with subsequent approval by Illinois EPA.

The issued permit expresses temperature values in ºF to provide clarity on how a 2% exceedance of an operating parameter value for temperature is to be determined. For parameters for which minimum values are set, immediate reporting would be required if the actual value of a parameter were 2% less than the set value; for maximum values, immediate reporting would be required if the actual values were 2% higher than the set value. In addition, the plant would have to report all exceedances in its quarterly reports.

The permit clearly defines the general mechanism by which the required or set values for operating parameters would be set, i.e., the value of the specified operating parameters during testing. Any further action or "interpretation" that becomes necessary with respect to the set values of operating parameters for the fermentation scrubber can occur in the processing of the operating permit for the plant by the Illinois EPA.

66. Condition 2.3.6(b)(ii) limits PM emissions from the fermentation scrubber to more than 0.1 lb/hr and 0.44 tons/yr. However, the permit does not include monitoring or testing

requirements to verify compliance with these limits. The application does not include details on physical control measures to limit PM emissions from this unit, such as limits on the dissolved solids concentration of the scrubbant water, the average aerodynamic aerosol diameter of the spray nozzles in the scrubber, or the type of demisting technology that will be used, if any. In the absence of such information there is no basis to make the determination that PM emissions will meet the specified limits.

The issued permit requires testing of PM emissions from the fermentation scrubber. This testing will provide the necessary basis to determine whether specific compliance procedures are needed to address PM emissions from the scrubber, which the application describes as having minimal PM emissions. If compliance procedures, i.e., work practices, sampling, instrumentation, or recordkeeping, are needed to address PM emissions, they can be established in the operating permit for the plant.

Miscellaneous VOM Emission Units (Condition 2.3)

67. For VOM emission units, there are inconsistencies in the description of units between the application and the draft permit and internal inconsistencies in the draft permit itself. For example, the "General Plant Process Flow Diagram Plant Emissions (Preliminary)" in the application indicates the cook water tank would be controlled. (This diagram does not even show the Centrate tank.) However Conditions 2.3.1 and 2.5.1 of the draft permit indicate that the cook water tank "would be controlled" by the oxidizer systems. Condition 2.3.2 indicates that the flash tank and cook water tank will not be controlled. Condition 2.3.6 also indicates that the cook water tank will not be controlled. The process flow diagram shows the flash tank being controlled, as it vents to the side stripper column in the distillation area, but the draft permit does not show this. Clarity and consistency are required for whether and how the units at the proposed plant will be controlled because of the small margin from the major source threshold of 100 tons/year.

The issued permit corrects these errors in the draft permit. The issued permit is based on the cook water tank <u>not being controlled</u>, as confirmed by Patriot. The permit is based on flash tank being indirectly controlled, as it vents to a process unit in the distillation area, which eventually is vented to the oxidizer systems.

68. The cook water tank receives once through flow from the fermentation scrubber and should contain significant amounts of ethanol. All of the VOM emissions potential of the mixer, a controlled unit following the cook water tank, comes from the ethanol laden cook water. The emission calculations in the application for the cook water tank also suffers from being derived from an existing 40 million gallon/year plant rather than being developed for the considerably larger proposed plant. The cook water tank should be required to be controlled by the oxidizers.

The information in the application for the cook water tank shows that this water holding tank would not be a significant source of VOM emissions, with both a low VOM concentration (less than 50 ppm) and low exhaust flow rate. While the water held in the

cook water tank may contain ethanol, the information in the application indicates that this ethanol is retained until the water is transferred to the mixer, which is controlled.

69. The application discounts the need for control of VOM emissions from several process tanks on the basis of brief Organic Vapor Analyzer measurements on a much smaller plant. Nothing in the application indicates that the tank process variables and design of the planned plant are the same as the plant for which measurements were made. For example, it is impossible to know from the application whether the tanks envisioned for the proposed plant and the tanks whose emissions were measured on the smaller plant both had submerged fill, a detail that could be relevant for whether the emissions are comparable.

The permit application adequately addresses these "miscellaneous emission units." The emissions from these tanks were properly calculated to account for differences in the size of the existing plants at which measurements were made and the size of the proposed plant, size and to account for other relevant factors in calculating VOM emissions.

The issued permit also appropriately addresses these units as it requires that the plant keep records for the VOM emissions of these units. The permit also includes provision for the plant to promptly have VOM emissions testing conducted for these units if requested by the Illinois EPA.

70. The projected VOM emissions for the stillage tanks, the syrup tank, the cook water tank, and the liquifaction tank were all calculated on the basis of the exhaust rates of tanks at a smaller plant with only 41% of the capacity of the proposed plant. There is no reason to believe the exhaust rates of these tanks will be the same at the proposed plant, with its larger tanks and higher throughputs. The emissions of these miscellaneous tanks could push the plant over the 100 ton/year major source threshold. Failure to properly consider the potential emissions of these tanks would constitute improper permitting the proposed plant. At the very least, the permit should require periodic testing of these tanks and mandate that a tank be controlled if found to have VOM emissions that would push the plant over the major source threshold.

It is not appropriate for the permit to specify particular consequences if the plant's emissions were to exceed the major source threshold. If this were to occur, it would be a violation and the specific consequences for violations are determined on a case-by-case basis in the context of a potential or actual enforcement action.

71. The Fugitive VOM Survey" in the application indicates that the mash screen, where residual material removed from the fermentation tanks during each cleaning cycle is screened, is a unit that should be controlled. But the downstream fugitive process VOM emissions potential for the wet solids flow is not completely characterized. The emission calculations in the application for the mash screen indicate that it will be controlled by the oxidizers, but this is not reflected in the draft permit. However, in the draft permit, the Mash Screen is shown without control, so the draft permit allows uncontrolled

emissions from these units. The is not included with the miscellaneous units, whose VOM emissions are limited to 0.65 ton/year.

While certain information in the application suggested that the mash screen at the proposed plant would be controlled, this is not the case. The mash screen operates intermittently so that it is not a significant source of VOM emissions. The permit for the proposed plant is based on the mash screen not being controlled, with its emissions addressed with other small, uncontrolled "miscellaneous units." With the explicit inclusion of the mash screen with the miscellaneous emission units, the issued permit now limits the VOM emissions from these miscellaneous units to no more than 0.70 tons/year, in total.

72. The emission calculations in the "Fugitive VOM Survey" in the application indicate that the centrate tank would be controlled by the oxidizers. However, the draft permit does not list the centrate tank, so the draft permit allows uncontrolled emissions from this unit. However, the centrate tank is not identified as one of the miscellaneous unit, whose VOM emissions are addressed as a group.

The centrate tank is to be controlled by the oxidizer/boiler systems, as indicated in Attachment A of the permit.

73. Condition 2.3.6(c) in the draft permit, which addresses emissions of "miscellaneous units," is not practically enforceable because the permit does not include testing and monitoring conditions that would provide for compliance determination or a short term emission limit that would make practical enforcement possible.

The issued permit includes recordkeeping and emissions testing requirements to make the limit for miscellaneous units enforceable as a practical matter. It is not necessary or appropriate to set hourly emission limits for these units given their nature.

74. Although the application indicates that the syrup stream from the evaporators is mixed with wet cake from the centrifuge before drying and that the evaporated water is sent to the biomethanator, this is not sufficient to ensure that VOM emissions do not occur as overhead vapor flow from a condensation operation to which evaporator vapors are directed. There is no information on whether eductors are used as a motive force for condenser flow and whether there are any emissions associated with the evaporation process for thin stillage.

The evaporators will not generate emissions. The evaporation process makes syrup, which is mixed with stillage that is dried. Condensate water is ultimately returned to the mash preparation area, after processing in the biomethanator.

Handling of Wet Cake (Condition 2.5)

75. The application does not include specific details on how wet cake will be managed. (Wet cake is feed material that is sold without being dried.) Without information on wet cake

process management, e.g., the temperature of the material as it is handled and the extent of indoor vs. outdoor management, the application is not complete and fails to adequately calculate the potential emissions of the proposed plant.

The emissions calculations in the application conservatively assume that all stillage would be processed into dried feed. This is conservative because processing of stillage and syrup into dry feed in the feed dryers generates more VOM emissions that handling the stillage wet, for sale as wet cake.

76. The application does not "ramp up" expected VOM emissions from some of the example smaller ethanol plant information cited for wet cake related emissions at points other than loadout. The application does not include adequate drawings to show whether ventilation flow through the centrifuges is routed to the dryers. However, if the dryers are control units for centrifuge exhaust during drying operations, then when wet cake is being produced, there may be an effect on the centrifuges as a VOM unit.

The emissions from production of wet cake were addressed on a per-ton-basis, so scaling of emission data was not required. Production of wet cake would not alter the emissions control requirements that apply for the associated oxidizers, which also must be operated to control various units in the mash preparation area and the distillation area.

77. The emission test results for VOM emissions from storage of wet cake submitted in the application were conducted when half the wet cake in the storage building was four days old. However, most VOM emissions can be expected to flash off very soon after the wet cake enters the storage area, when the wet cake is at elevated temperatures. Because of this, the cited VOM emission factor for wet cake storage cannot be considered to reflect the potential emissions for storage of wet cake. If wet cake is stored on a pad that is located outdoors, then the VOM emission calculations must consider the maximum ambient temperature together with maximum wet cake temperature when loaded onto the storage pad. In this regard, the Natural Resource Group work submitted by Patriot appeared to have been performed for unheated indoor storage area in Minnesota in November and would not reflect the potential emissions at higher temperatures.

    Finally, without restrictions on the maximum storage time, the potential for VOM emissions from biological degradation of wet cake during storage must be considered. Otherwise, the permit must require "first in, first out" methods of dispatch for wet cake and other controls on the length of time for storage in order to properly limit emissions from storage.

The information submitted for VOM emissions from storage wet cake indicates that this testing was conservatively conducted with additional "handling" of the warm wet cake entering the storage area, to increase exposure to the air and maximize VOM emissions from the wet cake. These actions would act to compensate for any effect from the actual air temperature of the storage building, the ambient temperatures associated with an outdoor storage pad, and variations in the duration of storage.

It is not necessary for the permit to specify "first in, first out" handling of wet cake. This is an obvious practice for handling of wet cake (as well as many other commodities), as is minimizing the length of time that wet cake is stored at the plant.

78. If uncovered wet cake is stored outdoors, this practice would pose a risk for water pollution due to stormwater runoff from the pile. If such stormwater were then controlled in a retention pond, the potential emissions of the pond must also be considered, in addition to the emission from the outdoor storage pad itself.

Any outdoor storage or handling of wet cake at the plant must be conducted in a manner to control any stormwater runoff, which is subject regulations that govern wastewater discharges from manufacturing plants. A common approach to stormwater management is collection of potentially contaminated storm runoff in a retention pond, to allow treatment if needed. Retention ponds at ethanol plants have not been identified as a source of concern for emissions.

79. Condition 2.5.6(e)(i) should limit hourly emissions from load-out of wet cake, rather than monthly emissions.

The permit intentionally limits emissions from load-out of wet cake on a monthly basis. This is because load-out of wet cake would not occur on a continuous basis. It would only occur if and as there were a market for wet cake from the plant, with shipments of wet cake most likely occurring by truck.

Distillation Area (Condition 2.4)

80. The application is incomplete because it does not showing the disposition of process off-gases from the molecular sieve regeneration cycle. Molecular sieves traditionally features two parallel process trains, with one in use for ethanol dehydration while the other is in a regeneration cycle. The regeneration cycle regenerates the molecular sieve matrix by removing water/weak ethanol solution using a vacuum. The vacuum apparatus and any condenser or steam eductor are likely to have some type of venting. Note that the condenser associated with molecular sieve regeneration will be different from the 200 proof condenser, which is used to process the ethanol vapor output of the molecular sieves during actual operation.

The regeneration of the molecular sieves would not generate VOM emissions that have not been otherwise accounted for. This is because the liquid stream from regeneration is recovered for its ethanol content. Any vapors from regeneration are eventually vented to the oxidizer/boiler systems.

81. For fermentation units, which are controlled by the oxidizer systems, Condition 2.4.5 should clarify that during the shutdown of units, the heat input level of an oxidizer shall be maintained above the specific level that has been previously demonstrated in emissions testing to show compliance with applicable limits.

The issued permit clarifies operating requirements for the oxidizer systems during shutdown of emission units. (See Condition 2.5.5-1(c).) However, it is not appropriate to require that a specific firing rate be maintained during such periods. The permit instead restates the general obligation that equipment be operated in accordance with good air pollution control practice. This requires that the temperature in the combustion chamber of the oxidizers be maintained at the "compliant" level for as long as it is feasible to do so, ideally until after process units are shutdown. If operation of process units lags behind the oxidizers, they must be expeditiously shutdown once the temperature in the oxidizers drops below the compliant level.

82. Condition 2.4.9(b) belongs in Condition 2.5, where all of the requirements relating to oxidizer operation should be consolidated.

The issued permit includes all operating requirements for the oxidizer/boiler systems in Condition 2.5, consistent with the recommendation made in this comment.

83. The operating parameters of the distillation area identified in Condition 2.4.9(a)(iii) and (iv) are not realistic indicators for operation of this area nor is the language clear. Does the "feed rate" refer to the condensers and thus the "feed" that is measured is ethanol vapor? Or is the feed rate the liquid output rate of the condensers? It is also not clear that monitoring of the specified parameters can be used to predict emissions from the oxidizers. If the objective of process-related monitoring is to determine emissions, then the gas flow from the two distillation condensers will be among the appropriate parameters of interest. If the calculation of emissions at the oxidizer associated with distillation VOM destruction is the objective, then it would also be necessary to determine the mass rate of VOM in such flows during emissions test, along with continuous volumetric monitoring. If the objective of the conditions is to relate VOM emissions from the oxidizer to the distillation process rate, it is not clear that the four independent process variables addressed in Condition 2.4.9(a) will achieve this a purpose.

The purpose of the records required by Condition 2.4.9(a) is to assure that the normal operating parameters of the fermentation operation are documented so that short-term or long-term changes in operation can be identified. These records are not intended to be used on a routine basis to calculate the contribution of the distillation area to VOM emissions as occur through the oxidizer systems. The operating parameters for which the issued permit requires the normal values of operating parameters to be kept are: 1) ethanol content of beer in the beer well; 2) feed rate to the beer column; 3) feed rate to the molecular sieve; and 4) condenser cooling water temperature.

84. If recordkeeping is required for distillation process parameters, the presence of monitoring devices to gain such information is implied. However, the draft permit does not contain conditions that require such monitoring devices to be calibrated or maintained or to conform to accurate measurement standards.

The issued permit specifies that the plant must operate all required monitoring devices and instrumentation in accordance with good monitoring practices. This requires that required monitoring devices and instrumentation be appropriately calibrated and maintained to provide accurate measurements.

85. The application does not include information on the potential for VOM emissions through pressure relief valves and rupture disks in the distillation area. If the distillation area will have pressure relief valves, rupture disks, or other kinds of bypass release devices, these devices should be listed and their emissions should be subject to recordkeeping requirements. If these devices are part of the design, reference to any emissions from such devices should be included in the recordkeeping requirements of Condition 2.4.9. In addition, these devices should be subject to the requirements of a Leak Detection and Repair Program.

Any pressure relief devices that are needed in the distillation area, with discharge to the atmosphere rather than to a control device, would be addressed by Condition 2.8 of the issued permit. This condition addresses components of the piping system and access hatches in process vessels at the plant that are in VOM service but are normally closed to the atmosphere. As such, Condition 2.8 is also the appropriate condition in which to address pressure relief devices. Condition 2.8 does require that the plant implement a Leak Detection and Repair Program, which program would have to extend to any pressure relief devices in VOM service in the distillation area.

Feed Dryers and Oxidizer/Boiler Systems (Condition 2.5)

86. A recent test of the thermal oxidizers at VeraSun Fort Dodge showed nearly 0.07 lbs NOx/million Btu, which is higher than the 0.05 lbs/million Btu factor cited as the manufacturer's guarantee for the proposed oxidizer system. The draft permit does not require a showing of continuous compliance on an hourly basis with the 0.05 lbs/million Btu factor

The application for the proposed plant includes the results of emission testing conducted in 2004 at the VeraSun plant in Aurora, South Dakota, which had a nominal capacity of 100 million gallons/year in 2004, similar to the proposed plant. This testing for VeraSun's Aurora plant showed lower NOx emissions than the testing at the Fort Dodge plant. The Aurora testing showed total NOx emissions of 0.039 lbs/million Btu and 16.37 lbs/hours, for the two oxidizer systems at the plant. This shows that an NOx emission factor of 0.05 lbs/million Btu can be met at the proposed plant.

As reflected in the permit, the plant must conduct continuous monitoring for NOx emissions for each oxidizer/boiler system, as required by the NSPS that applies to these systems. The permit also relies on the compliance procedures of the NSPS to determine compliance with NOx emission limits. As clarified in the issued permit, the permit requires NOx emissions to be determined on a 30-day rolling average basis, consistent with the form of the NSPS standard for NOx, building upon the compliance methodology provided by the

NSPS. **This provides a daily determination of compliance with the NOx emission limits for each oxidizer/boiler system.**

87. The emissions calculations in the application for the oxidizer systems are based on controlled emission factors of 0.465, 0.130 and 0.150 lbs/ton feed, respectively for CO, VOM and PM. The application indicates that these factors are based on the "ICM Emission Guide." However, the ICM Emission Guide was not included in the application nor was it otherwise made available to the Illinois EPA. (In June, 2006, I requested a copy of the application and all materials relied upon by Illinois EPA staff in making their decision to propose to issue a permit for the plant and the ICM Emission Guide was not among the materials provided by the Illinois EPA.) Both the application and Illinois EPA's review of it must be considered incomplete unless and until the "ICM Emissions Guide" is included in the application or otherwise placed in the public record so it can be evaluated and subjected to public scrutiny.

    Finally, the claimed emission factors should not be considered unless they are identified either on the basis of past emissions testing at comparable plants or they are to be certified as a manufacturer's guaranteed performance. The application does neither yet the permit limits are based on these emission factors. If ICM, as the manufacturer, is backing up the claimed performance, the application should state this, rather than referring to the "ICM Emission Guide," which was not provided.

As already mentioned, the application for the proposed plant includes the results of emission testing in 2004 at the VeraSun plant in Aurora, South Dakota. For the thermal oxidizers, this testing showed emissions of 18.3, 1.49, and 1.54 lbs/hr, for CO, VOM and PM (filterable only), respectively. Assuming that the plant operated at capacity during this testing (40 tons of dried feed/hour), this testing showed emission factor of 0.458, 0.037 and 0.039 lbs/ton of dried feed. This shows that the emission factors used in the application for the proposed plant can be met.

The application for the proposed plant was prepared for Patriot by ICM, as evidenced by the cover letter for the application and the copies of various documents included in the application. The fact that a copy of the ICM Emissions Guide was not included in the material provided in the application, or otherwise made available to the Illinois EPA, means that it was not relevant to the review of the application by the Illinois EPA or for the public comment period prior to the issuance the permit for the proposed plant.

88. The emission calculation for the feed dryer and oxidizer/boiler systems in the application used controlled emission factors of 0.465 and 0.13 lbs/ton feed for CO and VOM, respectively. However, these factors are not supported by the information cited in the application.

    The application states that the controlled CO factor is based on 95% control efficiency from the oxidizers with an uncontrolled CO factor of 10 lbs/ton feed, which yields a controlled CO factor of 0.5 lbs/ton feed. At 356,880 tons of feed per year, this factor

yields CO emissions of 89.22 tons per year, rather than 83.97 tons/year, which would make the proposed plant a major source when added to the CO emissions of other units.

The application states that VOM emissions are based on the oxidizers providing 97% control efficiency with an uncontrolled VOM emission factor of 10 lbs/ton feed. At 356,880 tons/year, this computes to annual emissions of 53.5 tons rather than the claimed 23.20 tons. A controlled emission factor of 0.13 lb VOM/ton feed with an uncontrolled factor of 10 lb VOM/ton feed, is equivalent to 98.7% control, not 97% control.

The controlled emission factors for the feed dryers and other units controlled by the oxidizer systems are engineering values based on the specific design for the proposed plant, as guided by actual experience at several plants. As is apparent from these comments, if uncontrolled CO emissions from the feed dryers are 10.0 lbs/ton of dry feed or higher, the oxidizer systems at the proposed plant will have to be operated to achieve greater than 95% control to meet the limits on CO emissions proposed in the application and carried over into the permit. In this regard, the 90% control requirement in the permit is a minimum requirement for the performance of the oxidizers, independent of the level of CO emissions generated by the dryers. The oxidizer systems must also be operated to comply with the hourly CO limit specified by the permit, 18.88 lb/hr, total. Oxidizers can be operated over a range of efficiencies, depending on the operating temperature that is maintained with the fuel burners

For VOM, as noted in these comments, the permit requires that the oxidizer achieve a minimum control efficiency of 98%, which is greater than the 97% proposed in the application. If the total uncontrolled VOM emissions from the various units at the proposed plant controlled by the oxidizers are 10 lbs/ton of feed, as conservatively assumed in the application, the oxidizers at the proposed plant could have to operate with a VOM control efficiency of 98.7%. If this level of efficiency is required, it should be within the capability of the oxidizers at the proposed plant. The application for the proposed Marquis Energy plant in Hennepin included emission test results for the efficiency of the thermal oxidizer at an ethanol plant operated by Glacial Lakes Energy in Watertown, South Dakota (Glacial Lakes). This testing showed the oxidizer had a VOM control efficiency of about 98.5%, with a controlled VOM emission factor of 0.08 lbs/ton of dry feed.

89. The application indicates that the SO_2 emission calculations for the proposed plant are based on emissions testing at Glacial Lakes, but test results were not included in the application. The draft permit does not include any compliance monitoring for SO_2 emission. At a minimum, the oxidizer/boiler systems should be subject to initial emissions testing for SO_2 and emissions or operational monitoring to ensure compliance.

The results of the SO_2 emission testing at Glacial Lakes, which show SO_2 emission of 0.17 lbs/ton of dry feed, have been submitted to the Illinois EPA. The emission calculations for the proposed plant were conservatively performed using an SO2 emission factor of 0.45 lbs/ton. The issued permit requires emissions testing for SO_2 emissions from the oxidizer/boiler systems. Recordkeeping is required for use of sulfuric acid in the

fermentation process, which was identified in the application as the source or origin for SO_2 emissions during feed drying.

90. For any limit expressed in lb/million Btu, these oxidizer/boiler systems will pose special and complex problems if compliance monitoring relies on "F factors" developed by USEPA. The introduction of the dryer gases, in addition to natural gas combustion in these systems, means that natural gas F factors cannot be used. There must be a clear and Illinois EPA approved procedure for determining F factors for compliance purposes at this plant.

As noted by this comment, for the dryer/oxidizer systems, it will likely not be possible to use F Factors in the procedures to convert monitored data for NOx into the terms needed to determine compliance with the NOx emissions. However, the procedure that is to be used in place of an F factor should not and need not be established by the permit. This is because any such source-specific procedure would be approved by USEPA, rather than the Illinois EPA, as the USEPA reviews and approves source-specific monitoring and compliance procedures for units subject to NSPS.

91. Condition 2.5.6(a)(i) requires the oxidizer to achieve 98% control efficiency for VOM or reduce VOM emissions to no more than 10 ppmv, whichever is less stringent. Similarly, Condition 2.5.6(a)(ii) requires 90% control efficiency for CO or a concentration of no more than 100 ppmv, whichever is less stringent. These concentration limits are not properly enforceable and are inappropriate in the absence of a specific oxygen or carbon dioxide correction factor.

Emission limits expressed in terms of actual stack gas concentration, without "correction factors," as established in this comment, are fully enforceable. While correction factors are commonly used when setting concentration-type limits for boilers and incinerators, this is not the case for process units like the feed dryers and other VOM process units that are being controlled by the oxidizers. For Condition 2.5.6(a), which addresses the oxidizer/boiler systems as they function as control devices for VOM and CO emissions, it is not necessary that correction factors accompany the concentrations limits for VOM and CO emissions.

92. The VOM and CO limits for the feed dryers in Conditions 2.5.6(a)(i) and (ii) do not properly limit the potential emissions of the dryers through physical limits on the process or production rate in order to ensure that both the hourly and annual time rate of mass emission limit will be achieved. At a very minimum, the permit must limit annual and short-term feed production by the plant.

These conditions contain operational limits that, together with other limits in the permit, act to limit the potential emissions of the feed dryers and other units controlled by the oxidizers. In addition, the issued permit does include an annual limit on the total feed production by the plant. To address feed that would leave the plant as wet cake, the condition provides that wet cake is to be addressed in terms of the equivalent amount of dry feed.

93. The permit must also limit the amount of natural gas fired in the feed dryers and oxidizer/boiler systems to a level consistent with the information in the application. Limits on natural gas usage for the entire plant cannot effectively limit emissions when different units have different emission rates on a pound per scf or million Btu basis. In addition, the actual heat input to the oxidizers is not limited by the draft permit. The restriction in the draft permit is a design limit rather than an operational or production rate limit because it limits the heat input capacity of these units. The condition should limit the actual heat input, rather than just the "capacity."

The limits in the permit on total natural gas usage by the plant are sufficient and the permit does not need to separately limit the natural gas usage by the dryer/oxidizer systems. The emission calculations for these systems are based on the capacity of these systems, as explicitly addressed in the permit by the conditions that this comment suggests are inadequate. In addition, these systems account for over 95 percent of the permitted NOx emissions of the proposed plant.

94. The design drawing for the oxidizers submitted in the application shows a small transfer line from the natural gas main to the larger waste gas line before entry to the oxidizer. The emission calculations presented in the application do not address the emission consequences or purpose of this line, which is labeled "assist gas." This is clearly a route for introducing natural gas to the oxidizer that is separate and distinct from the natural gas line to the burner. A permit should not be issued unless the purpose and emission consequences of the "assist gas" line are fully explained to ensure that "assist gas" added to the waste gas feed to the oxidizers are properly subjected to monitoring and review as to impact on emissions and throughput of the oxidizers.

As suggested by its name, the "assist gas" line allows natural gas to be added to the waste gas sent to the oxidizers, which comes from certain mash preparation units and the distillation units, to enhance the heat content of this gas. The role of the assist gas would be to facilitate combustion of the waste gas in the oxidizer and the assist gas would be burned with the waste gas. Thus it is not necessary to consider assist gas as part of the burner capacity of the oxidizers.

95. To be consistent with a relevant USEPA determination on the relationship between feed dryers and oxidizers with heat recovery steam generators (HRSG), the permit should prohibit operation of the dryers solely to provide heat to the HRSG, other than for pre-heating the dryers. For the oxidizer/boiler systems at the proposed plant, the applicable requirements of the federal NSPS are affected by total rated heat input of these systems being below 250 million Btu/hr. If the heat input was more than 250 million Btu/hr, certain requirements of the NSPS would be more stringent. The two oxidizer burners are each 122 million Btu/hr for a combined rated heat input of 244 million Btu/hr, which is just below 250 million Btu/hr.

In particular, USEPA has made a determination for systems like those at the proposed plant stating that the feed dryers should not be considered part of the steam generating unit for purposes of the NSPS. In its determination, USEPA explained:

> The purpose of the DDGS dryers is to produce marketable dried grains. Although the DDGS exhaust provides some heat input to the TO, the TO is the source providing exhaust gas directly to the HRSG. Furthermore, the combined cycle system of the TO-HRSG can operate to produce the required steam for the plant output without the heat input from the DDGS dryers. Therefore, the EPA finds that the DDGS dryers are separate sources and are not part of the TO-HRSG combined cycle system. (Letter from Michael Alushin, USEPA, to William Roddy, ICM, July 29, 2004, NSPS Applicability Determination, USEPA Control Number 0500059)

To be consistent with USEPA's determination, the permit should prohibit operation of the burners in the feed dryers solely to provide heat to the HRSG, without drying of wet material, other than for warm up of the dryers. If the dryers were operated solely to provide heat to the heat recovery steam generators, the dryers would be operating for the primary purpose of providing heat for steam generation.

The permit does not need to prohibit operation of the dryers as requested by this comment. This is because it is not reasonable for the burners in the dryers to be operated for purposes that are unrelated to drying of feed. The burners in the oxidizers have ample capacity, sufficient to provide the heat input to the HRSGs to produce the steam for the plant when feed is not being dried. The oxidizers are also located immediately before the HRSGs, so as to efficiently provide this heat, without the operational complications that would accompany running feed dryers when they are empty. Moreover, it is exactly because of this "boiler-like" capability and the placement of the burners in the oxidizers that the oxidizers and associated HRSGs qualify as steam generating units for purposes of the NSPS.

Incidentally, each of these systems is a separate steam generating units for purposes of the NSPS, so that the applicable requirements of the NSPS would not be altered even if it were appropriate to combine the rated capacity of the burners in the dryers and the oxidizers. The other issues addressed by this USEPA determination, i.e., whether the oxidizers should be considered duct burners and how compliance with the NSPS should be determined, were more significant for these systems than the USEPA's action confirming that the feed dryers are considered separate units for purposes of applicability of the relevant NSPS.

96. The permit should require all emission testing to be done at maximum process rates. In addition, further test conditions during a series of emissions tests should also show compliance with VOM and CO control requirements, stack gas concentration and percentage reduction requirements at the lowest oxidizer heat input rate for the unit that is expected in regular operations.

As already explained, emissions testing must be performed at levels that reasonably represent the maximum operating rate or production rate of process equipment.

97. Condition 2.5.5(c)(iv) raises the possibility of different operating modes of the process units at the plant. The provision should be clearly require that any proposed alternate operating mode of process equipment, including 100% or less wet cake dispatch from the plant, be evaluated in emission testing.

This condition addresses operation of the oxidizer/boiler systems in conjunction with emissions testing. The purpose of this condition is to allow the plant to operate these systems at different combustion chamber temperature(s) if the plant wants to conduct testing at different temperature(s) to evaluate the effect on emissions. In the absence of this condition, once initial emission testing of the systems was conducted, the systems would always have to be operated to be consistent with the initial emission tests, which could never be revised. This is because the permit would not authorize operation at a different temperature, even for the purpose of emissions testing.

98. The permit should not allow continuous emissions monitoring for CO to be discontinued. The emission factor used for the oxidizer/boiler systems for CO is below the applicable USEPA factor in AP-42. Monitoring of CO emissions also serves as a surrogate for monitoring of VOM emissions, in a manner that is more direct than mere monitoring of combustion temperature and flue gas oxygen, which should still be required by the permit. If a control device is needed to assure compliance with emission limits, continuous emission monitoring should be required to assure continuous compliance.

The federal NSPS, which establishes the requirements for monitoring NOx emissions from the oxidizer/boiler systems, allows NOx monitoring to be conducted either with traditional continuous emissions monitoring or, following appropriate technical demonstration and approval, with parametric monitoring. A similar approach is also generally appropriate for emissions of CO. If emissions of CO from the oxidizer/boiler systems can be reasonably addressed without continuous emissions monitoring, continuous monitoring should not be required. This is particularly true as this may require routine operation of a unit with a greater margin of compliance from applicable limits and standards than would be provided with emissions monitoring.

The circumstances for CO emissions are not altered by the fact that CO can serve as a surrogate for VOM. If the oxidizer/boiler systems can be operated so that compliance with CO limits can be readily verified without the need for CO monitoring, this also means that the systems can be operated so that compliance with VOM limits is also assured.

The presence of a control device on a unit is only one factor that should be considered when deciding whether continuous emissions monitoring is appropriate. Other relevant factors include matters such as the type of unit, the type of control device, the applicable limit or standard, the expected actual emission rate, the size of the unit, and compliance procedures other than emissions monitoring that can be implemented for the unit.

99. The provisions in the draft permit for continuous emissions monitoring should include formal citations to federal regulations that set requirements for continuous monitoring and methods and procedures for quality assurance, quality control, recordkeeping and other matters. Instead of general reference to the "NSPS," the condition should specifically cite federal regulatory requirements with appropriate references to the CFR. General citations to "NSPS" leave too much room for interpretation and non-definitive conclusions about applicable requirements. Requirements for relative accuracy tests on continuous emission monitoring equipment should be clearly expressed with reference to relevant requirements of federal rules.

The issued permit appropriately addresses requirements of the NSPS with respect to emissions monitoring. Given the detailed nature of these provisions, and the fact that USEPA occasionally updates these provisions, it is appropriate for the permit to provide a general references to the relevant regulations. An attempt to comprehensively incorporate into the permit individual references for all of the requirements of the NSPS for emissions monitoring poses greater danger of confusion or controversy, as particular provisions are overlooked or are revised by USEPA in the future.

100. The condition in the draft permit requiring continuous monitoring for the combustion chamber temperature in the oxidizer/boiler systems is subject to interpretation because the temperature scale is not specified and there is no standard (such as ASTM procedure)indicated for verifying the accuracy of the measurement device.

In the issued permit, provisions related to temperature are expressed in Fahrenheit (ºF), so as to define other requirements of the permit related to such temperatures. If the plant elects to keep records using another temperature scale, the plant would have to appropriately implement requirements related to temperature so as to achieve at least equivalent results, as if temperatures were measured in ºF . As previously explained, it is not necessary to specify a measurement protocol for temperature measurements.

101. For the oxidizer/boiler systems, the permit should require continuous monitoring for flue gas oxygen concentration and flow rate, as well as combustion temperature. Monitoring of these two additional parameters is required to verify proper combustion conditions and confirm compliance with hourly emission limits. The monitoring required for these parameters should include numerical tolerances on the accuracy of the measuring devices, requirements for testing to verify accuracy and the specification of required standards (such as from ASTM) for quality assurance/quality control testing. These provisions should not simply rely on a "manufacturer's recommendations." Reliance on "manufacturer's recommendations" is too vague to be enforceable in practice.

For afterburners, including oxidizer/boiler systems like those at the proposed plant, operational monitoring of combustion chamber temperature is generally sufficient to confirm proper operation for effective combustion. Additional operational monitoring, as suggested by this comment, is only considered if specific circumstances are present, e.g., low oxygen content in the exhaust stream from the process stream or an afterburner whose

capacity is not sufficient if all process units served by the device are being operated. These circumstances are not present for the oxidizers at the proposed plant.

102. The operating ranges for combustion temperature and oxygen in the oxidizers must reflect evaluation of continuous monitoring for both NOx and CO, since simultaneous compliance with both requirements will increase one pollutant while decreasing another.

While the oxidizers must simultaneously comply with applicable emission limits for NOx and CO, this does not pose special concerns. Unless otherwise provided by a specific standard or limit, all emission units must simultaneously comply with all applicable requirements and limits. This is routinely considered when emissions calculations are performed for a unit that emits both NOx and CO, as a set of emission factors is used that can both be met simultaneously. If the factor for either pollutant is adjusted, the effect of the adjustment is considered with revised emission calculations for the other pollutant. As a result, the limits that are eventually set for a unit should be such that both limits can be met and they are not mutually exclusive. In addition, emissions testing, or emissions testing and monitoring, are conducted in a manner that confirms that both limits are met.

103. Condition 2.5.8(a)(iii) in the draft permit is incomplete, requiring operational monitoring for "Damper valve position for (sic)."

The issued permit completes this condition, requiring monitoring of the position of damper or valve in the duct work that directs exhaust streams from units other than the feed dryers to the oxidizer systems. (See Condition 2.5.8-1(c).)

104. For parametric monitoring, such as the damper provisions in Condition 2.5.8, every monitored parameter should invoke recordkeeping to ensure that such data is available for enforcement purposes. In addition, for all parametric monitoring devices, each such monitoring indication that will be relied upon for ensuring compliance must feature a method by which the variance in a monitored parameter can be associated with a threshold for noncompliant operation of a unit.

The issued permit specifies that records must be kept of the data measured by required monitoring devices and instrumentation. (See Condition 1.4 of the permit.) The permit also specifies that certain "key" operating parameters will be used as direct indicators of compliant operation for specific control devices, with acceptable values or ranges of those parameters based on the values of the operating parameter during emissions testing. However, it is not necessary for all operating parameters for which monitoring or instrumentation is required to be treated in such manner. Monitoring or instrumentation of operating parameters can also be required to collect data that can be used to document the plant's operating practices and generally facilitate ongoing review of plant operation by the Illinois EPA.

105. While the draft permit limits the amount of natural gas used at the plant, it would not require that that natural gas usage be monitored continuously, either for the plant or for specific units. The permit should require monitoring of natural gas usage on at least an

hourly basis, along with recordkeeping and reporting requirements related to natural gas combustion. When combustion units have different emissions per unit of gas combusted, each unit should have a specific natural gas combustion monitoring requirement.

The draft permit required instrumentation for the natural gas usage by each oxidizer/boiler system. In addition, the issued permit also requires instrumentation for natural gas usage by each pair of feed dryers. This requirement has been included in the issued permit because compliance or emission determinations for the oxidizer/boiler systems may require information on the natural gas usage in the feed dryers.

106. The recordkeeping for natural gas usage should be sufficiently detailed to determine hourly emissions from each natural gas combustion unit each hour of the year. The permit should provide for natural gas flow monitors with accuracy determined according to a known national standard as an enforceable permit condition.

The monitoring requested for combustion units by this comment is not justified. Hourly monitoring of natural gas usage is not required to assure that a combustion unit is being properly operated.

107. The recordkeeping requirements in Condition 2.5.9 discuss monthly recordkeeping on feed production and natural gas usage, but where compliance requirements and limits on emissions go to hourly emission limits, hourly data integration is essential to assure compliance with annual limits.

The permit requires that all relevant emission data be compiled when verifying compliance with annual emission limits. For this purpose, it is expected that for many emission units this would entail determining emissions as if the unit and associated control device operated normally at all times and combining this "base value" with specific data to account for any additional emissions that occurred in any periods when the unit did not operate normally. Accordingly, the determination of emissions would not require detailed information for periods of normal operation, as shown by relevant operational records, when the emissions would be adequately addressed by the emission factors for normal operation. For units and pollutants for which emissions monitoring is conducted, hour-by-hour emission data would be appropriately used to verify compliance with annual limits.

108. Condition 2.5.10 on reporting does not appear to require a complete protocol/suite of traditional continuous monitoring quarterly reports. The reporting provisions should be considerably more robust, indicating that continuous monitoring reports for NOX and CO be submitted quarterly and that such reports contain information for any emission violations and their causes, information for monitor downtime and its causes, summaries for both emission violations and monitor downtime as a percentage of unit operating time, and other traditional measures. Similarly, for required parametric monitoring, reports, the permits should clearly require reports that included summaries of applicable data and information on accuracy testing, parameter exception periods, monitor downtime.

As previously explained, continuous emissions monitoring must be conducted in accordance with relevant monitoring requirements of the federal NSPS, included detailed reporting of information as addressed by this comment.

109. Condition 2.5.11(b) of the draft permit would interfere with USEPA's credible evidence rule by creating a presumption that compliance with emission limits for pollutants other than NOx can only be determined based on equipment operation, as addressed by required records, and appropriate emission factors based on emission testing. All credible evidence should always be considered in compliance determination. As written, Condition 2.5.11(b) could even be construed to interfere with emission testing or use of operating parameters that are not addressed in required recordkeeping as a means to determine compliance.

Condition 2.5.11(b) of the draft permit does not restrict use of credible evidence to determine whether the oxidizer/boiler systems are in compliance. It merely restates the commonsense principle that the emissions of these systems must be determined from how these systems are operated (which is addressed by records required by the permit) and appropriate emission factors (which would most likely be based upon emission testing for the systems). During the period of emissions testing, the appropriate emission factor for a system is unquestionably the emission factor actually measured during testing. During other periods, the appropriate emission factor might or might not be the specific emission factor measured during testing, depending on how a system was being operated. During period when a system was operating improperly, engineering judgment would necessarily have to be used to establish an appropriate emission factor to specifically address such period, which factor could be significantly different than the factor actually measured during emissions testing.

110. Condition 2.5.11 does not contain compliance procedure for the oxidizer/boiler systems to address compliance with NOx limits.

The compliance procedures for NOx emissions from the oxidizer/boiler systems are generally set by the NSPS, so that they do not need to be addressed in Condition 2.5.11. The NSPS requires continuous monitoring for emissions of NOx, as addressed in Condition 2.5.8-1(d) of the issued permit. This condition reflects provisions of the relevant federal rules, 40 CFR 60, Subpart Db, as they govern the NOx emissions of the oxidizer/boiler systems at the proposed plant. These rules require that the NOx emissions from each system be continuously monitored. However, this monitoring may be performed either directly, with an instrument that measures the concentration of NOx in the stack, or indirectly, with parametric monitoring, by monitoring appropriate system operating parameters to allow NOx emissions to be calculated. This indirect approach to monitoring is set forth in a parametric monitoring plan, which is prepared by the source and, for units in Illinois, must be approved by the Illinois EPA. If a source elects to pursue development of a parametric monitoring plan, the source must continue to directly monitor emissions until the plan is approved. A plan can only be approved if the source demonstrates that there is a consistent relationship between certain operating parameters of the boiler, such as load and oxygen concentration in the flue gas, and NOx emissions, so that NOx emissions can be reliably determined with operational monitoring of the oxidizer/boiler system.

111. The application does not address the emission implications from wastewater collected in the knockout drum and its subsequent handling. The knockout drum reduces PM emissions from the oxidizers associated with liquids and aerosols entrained in the waste gas.

As indicated in the comment, the knockout drum removes entrained liquids from a gas stream that is controlled by the oxidizer systems. Since the knockout drum eventually "vents" its gas stream to the oxidizers, it is not reasonable to expect other emissions from this unit. The water stream from the knockout drum would not be a separate source of emissions, as it would be reused at the plant.

Feed Cooler (Condition 2.5)

112. Condition 2.5.5(f)) of the draft permit, which provides that "There shall be no direct discharge from the cooler or baghouse to the atmosphere," is inconsistent with the application and other conditions of the permit. It is clear from the application and from the draft permit (with the exception of Condition 2.5.5(f)) that a portion of the exhaust from the feed cooler baghouse would go to the atmosphere. The narrative in the application states that the discharge from feed cooler baghouse is used as combustion air for the oxidizers, with only approximately 13,000 cfm from the baghouse going directly to the atmosphere. Condition 2.5.1 in the draft permit indicates that the "Feed cooling drum is controlled by a baghouse and partially vented through the oxidizer/boiler systems." Condition 2.5.6(c) sets emission limits for the feed cooler, addressing the emissions of the cooler that are not controlled by the oxidizer system.

Condition 2.5.5(f) of the draft permit, which was inconsistent with other provisions of the permit as noted by this comment, has not been carried over into the issued permit.

113. The emission calculations in the application for the feed cooler/baghouse are based on only 13,000 cfm, out of the 50,000 cfm total exhaust flow, being vented directly to the atmosphere. However, the application does not show how this will be assured. The drawing for this system submitted in the application (ICM's preliminary design for the cooling system at the Andersons Clymers plant in Indiana) shows combustion air for the dryers and oxidizers being diverted from the cooler baghouse exhaust by two forced draft fans serving the dryers and oxidizers. This does not explain how the direct discharge to the atmosphere will be less than 13,000 cfm, so as to be consistent with the emissions calculations for the cooler and ensure that the plant is not a major source.

The permit should limit the volume of the direct discharge from the feed cooler/baghouse to no more than 13,000 cfm. In addition, the permit should limit the volume of this discharge to the level during emission testing. To do this, the permit must require continuous monitoring of the flow rate of this discharge. Monitoring is needed because the volume of this discharge will be affected by the operating level of the combustion air fan for each oxidizer, which will alter the pressure in the ductwork after the baghouse, with variability in combustion air rates inherent with overall process variability.

The issued permit limits the volume of the direct atmospheric discharge from the feed cooler to a level that is consistent with the level during emissions testing. When the discharge is restricted in this manner, it is not necessary or appropriate to limit the discharge to 13,000 cfm, as the required or permissible maximum flow of this discharge could either be greater or smaller than 13,000 cfm. The issued permit also requires continuous monitoring for the actual volume of this discharge.

114. The feed cooler receives heated material from the feed dryers. As long as this material is at an elevated temperature, it may continue to emit VOM from desorption of VOM containing liquids and from thermal decomposition. As a result, the feed cooler exhaust should be subject to emissions testing for VOM.

The issued permit requires testing of the direct discharge from the feed cooler for VOM emissions, as recommended by this comment.

115. For the feed cooler, additional condensible PM, which was not considered in the application, could push the plant over the 100 ton/year major source threshold. The feed cooler, has the potential for continued thermal generation of emissions, because of the elevated temperature of the dried feed entering the cooler. These emissions can be expected to include condensible PM, but emissions from the feed cooler were calculated solely as filterable PM, based on the guaranteed baghouse performance of 0.005 gr/scf. At the VeraSun plant in Fort Dodge, Iowa (a 110 million gallon/year plant), emissions testing of the feed cooler bypass, showed most of the PM emissions were condensible PM (0.016 and 0.128 lb/hr for filterable and condensible PM, respectively) or potential emissions of 0.56 ton/yr from a feed cooler that discharges only a portion of its exhaust to the atmosphere, like the cooler at the proposed plant.

The test data from VeraSun confirms the conservative nature of the emissions calculations in the application for the proposed plant. The exhaust volume from the feed cooler at VeraSun is about the same as the expected volume of the direct discharge from the feed cooler at the proposed plant (12,000 scfm compared to 13,000 scfm). Accordingly, the testing at VeraSun indicates that the actual PM emissions of the feed cooler at the proposed plant would be 0.6 tons/yr. The application for the proposed permit accounts for and the permit limits PM emissions from the proposed feed cooler to 2.4 tons/yr.

116. The permit should limit the maximum temperature of feed entering the cooler or the temperature of the feed cooler to ensure compliance with VOM emission limits.

It is not appropriate to set operational limits on the feed cooler as requested by this comment in the construction permit for the proposed plant. While the operating temperature of the cooler would theoretically affect VOM emissions, available data does not address the magnitude of this affect or show that the normal range of cooler operating temperature would be such that changes in temperature would meaningfully affect the level of VOM emissions. The need for requirements on the operating temperature of the cooler is more appropriately addressed during the review of the operating permit

application for the plant, when actual operating information and VOM emission data for the cooler are available.

117. The plant process flow diagram shows a series of conveyers for the feed dryers and the feed cooler. The application does not show that these conveyors will be controlled. Like the feed cooler, these conveyors have the potential for emissions. However, there is no consideration of VOM, PM or CO emissions from these units in the overall emission calculations. Without this information, the application is incomplete.

These conveyors will be controlled by the feed cooler baghouse and the emissions of these conveyors are addressed in the emission calculations for the feed cooler.

Cooling Tower (Condition 2.10)

118. To assure compliance with applicable emission limits for the cooling tower, the permit must require monitoring and periodic inspections of the cooling tower. The permit should also require monthly monitoring of the total dissolved solids (TDS) content of the circulating cooling water to ensure that the TDS content does not exceed 2500 ppm. The tower must also be subject to a requirement that the TDS content of the cooling water does not exceed 2500 ppm.

The issued permit includes additional requirements for the cooling tower, as generally recommended by this comment.

119. The permit should require quarterly measurements of the ethanol content of cooling water, measured at a point in the distillation area directly downstream of the condensers. This is needed to verify that that the condensers are not leaking, due to corrosion or other degradation.

It is not appropriate for the construction permit for the proposed plant to mandate specific requirements of the type suggested in this comment. In the absence of actual experience at a specific plant demonstrating failure to properly implement particular maintenance practices, a permit is issued based upon the presumption that all equipment will be properly maintained and repaired as necessary to prevent or promptly correct failures that would lead to increased emissions, such as the type of equipment failures described in this comment. This includes not only maintaining the integrity of heat exchangers, but also maintaining the integrity of other features at a plant, including enclosures, tanks, ductwork, fans, and stacks.

120. The permit should prohibit any introduction of any kind of any process water into the cooling water that circulates through the cooling tower

The issued permit prohibits intentional introduction of process water into the cooling water and requires that any leaks be promptly repaired.

Bio-methanator (Condition 2.9)

121. The permit should limit the operation of the biomethanator flare to no more than 1000 hours per year to support the emission calculations.

It is not appropriate to limit the operation of the biomethanator flare as requested by this comment. This is because the flare serves as a safety device, for disposal of biogas when it cannot be used as fuel. In addition, as the preferred disposition of biogas is use as fuel at the plant, any "extra" flaring of biogas would only occur due to major interruptions in the other operations at the plant, which would be accompanied by a net reduction in emissions from the plant.

122. For the biomethanator flare, the application started from the VOM emission factor from AP-42, 0.14 lbs of total organic carbon (TOC) per million Btu, and adjusted the factor based on the methane and ethane content of the flared gas (63%). This reduced the emission factor to 0.052 lb VOM/million Btu, which was then used to calculate VOM emission from the flare. This adjustment was made on an assumption that only regulated VOM should be considered in the VOM emissions of the flare.

    This approach is flawed. It underestimates VOM emissions from this flare because it takes full credit for what USEPA indicated in AP-42 was 8 volume percent emissions of ethane/ethylene, but ethylene is a VOM. Further, ethane is not a likely product of incomplete combustion of ethanol vapors because of the presence of oxygen and its position in the ethanol molecule. The VOM emissions of this flare should be recalculated using the AP42 factor without any adjustment.

Adjustment to the AP-42 factor for flare emissions is required because AP-42 provides an emission factor, as cited above, in terms of total hydrocarbons (THC). Moreover it is appropriate that this adjustment should be of the magnitude made in the application. This is because the function of the biomethanator process is to produce a methane-rich, fuel quality gas from the organic material in certain process wastewater streams. It is this methane-rich gas that is being flared, not ethanol vapors.

123. The application did not show any PM emissions from the biomethanator flare but the draft permit shows 0.44 tons/year of PM. The application did not account for condensible PM emissions from other flares.

As noted in the comment, the Illinois EPA accounted for the PM emissions from the flare, assuming potential PM emissions of 0.44 tons/year, including both filterable and condensible PM. This value is adequate, as "smokeless flares," as required at the proposed plant have not been identified as significant sources of PM emissions.

Roadway Emissions (Condition 2.11)

124. When calculating potential PM emissions from the roadways at the proposed plant, the application used a silt loading factor of 0.4 gram/meter^2, which yielded potential PM

emissions of 33.74 tons/yr. However, the use of a factor of 0.4 gram/meter^2 for the average silt loading on roadways at an industrial plant is not correct and is not supported by AP-42, as incorrectly claimed in the application. Even if plant roadways were public roads, the lowest silt loading provided by USEPA in AP-42 as the "ubiquitous baseline" for public roads with less than 500 average daily traffic volume is 0.6 gram/meter^2. This factor is also subject to multipliers during the winter if roads are treated for anti-skidding. Calculation of roadway emissions for the proposed plant, using a silt loading of 0.6 gram/meter^2 and all other factors being the same, yields potential PM emissions of 43.9 tons/year from the plant, which would make the plant a major source for PM emissions.

The issued permit requires that measurements be conducted for the silt loading on roadways at the plant. These measurements, together with other provisions of the permit, should assure that the PM emissions of roadways at the plant are appropriately controlled so as to maintain PM emissions with the limits set by the permit. In this regard, the roadways at the plant are not public roads and will be subject to requirements for regular sweeping, flushing or other dust control measure to minimize dust emissions.

125. Use of a silt loading of 0.4 gram/meter^2 also is not supported by actual experience. A review of the data for silt loading used for other grain processing plants and the permitting practices of other Midwestern states shows roadway silt loadings that range from 0.5 to 7.4 gram/meter^2. This review shows that the 0.4 gram/meter^2 silt loading used for the proposed plant is too low.

The material provided with this comment confirms the need for measurement of the actual silt loadings on plant roadways, as required by the issued permit.

126. The draft permit does not contains measures that will ensure that the 0.4 gram/meter^2 silt loading and the associated limit on PM emissions from roadways will actually be met. There are no specific requirements for periodic sweeping and cleaning of roadways that would allow such a level of silt loading to be achieved. Mere reliance on a future plan, with applicant-discretionary measures that are not enforceable in practice, cannot ensure compliance with the associated emission limit. At a minimum, if a permit is issued based on a silt loading of 0.4 gram/meter^2, the permit must require that such silt loading be achieved in practice, together with quarterly testing requirements.

The issued permit includes additional requirements for the fugitive dust control program to assure that program developed by the plant includes emission control measures that should assure that associated limits on PM emissions are met. Given the variety of control measures that could be used by the plant, for a plant that has not even been constructed, it is not appropriate for the permit to specify specific measure that must be used to control PM emissions from roadways.

127. Without a clear physical limit on the potential to emit, achievement of the emission limit in the draft permit for roadways cannot be ensured. The emission calculations assume most material will be shipped from the plant by rail. However, the permit does not guarantee that truck traffic will not exceed these levels. The permit should include limits

on annual truck VMT, reflecting the assumptions underlying the PM emissions calculations for the plant.

The application conservatively, i.e., generously, accounted for the truck traffic at the proposed plant when calculating PM emissions of roadways. Accordingly, it is not necessary to explicitly limit the amount of truck traffic. The amount of truck traffic is adequately restricted by explicit limits on the overall receipts of grain and production of ethanol by the plant and by the physical location of the plant, which restricts the amount of material that can transported be truck.

Other Provisions of the Permit

128. The plant can be expected to have natural gas fired space heating units in various building. Although these units may be exempt from permitting, they still count towards the total emissions of the plant for comparison with the major source threshold. Applicant must disclose the total emissions associated with such space heating units as part of a complete application.

The usage of natural gas by space heating units at the plant is addressed by the permit, as the permit limits total usage of natural gas by the plant and the total emissions of different pollutants from the plant.

FOR ADDITIONAL INFORMATION

Questions about the public comment period and permit decision should be directed to:

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